

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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Hyatt's Circulating and Filtering Plant for Steam Boilers.

We recently had occasion to examine, at the works of the Newark Filtering Company, at Newark, N. J., a number of the several interesting designs of Mr. J. W. Hyatt for the purification of water and the prevention of incrustation in steam boilers.

obtained by him entitle the system to careful consideration. From the functions which the various feed water heaters and purifiers now on the market are designed to secure, it will be understood that a number of the impurities in water generally used for steam raising are held in solution at ordinary temperatures of the water, but are either wholly or partly precipitated on the application of heat, being either less soluble in hot than in

either held in solution originally or in mechanical suspension, is deposited instead of in the boiler itself. All possibility of any of the solid particles re-entering the boiler is, moreover, cut off by the filtering attachment. The pipe system further embraces the feed-pipe disposed in a manner which we shall presently explain.

A good idea of the general arrangement of the plant can be gained from Fig. 1,

through C (pipe E in Fig. 1) reaches the interior of the spring A, causes elongation, and, issuing from between the several coils, mixes with the cold feed water in the space D. The mixture then passes on through the pipe B, which corresponds to the pipe F in Fig. 1. The heating of the feed-water, in the heater just described, causes a large proportion of the sulphates and carbonates in solution to be precipitated,

quantity of water which passes through it is furnished by the feed pumps, while the other half is drawn from and again returned to the boilers. From this circulating pump the water is fed to the boilers through the pipes M and N. When the feed pumps A are idle the pump G takes its entire supply from the boilers, thus causing circulation of a larger quantity of water. The circulating water, we will here add, is taken

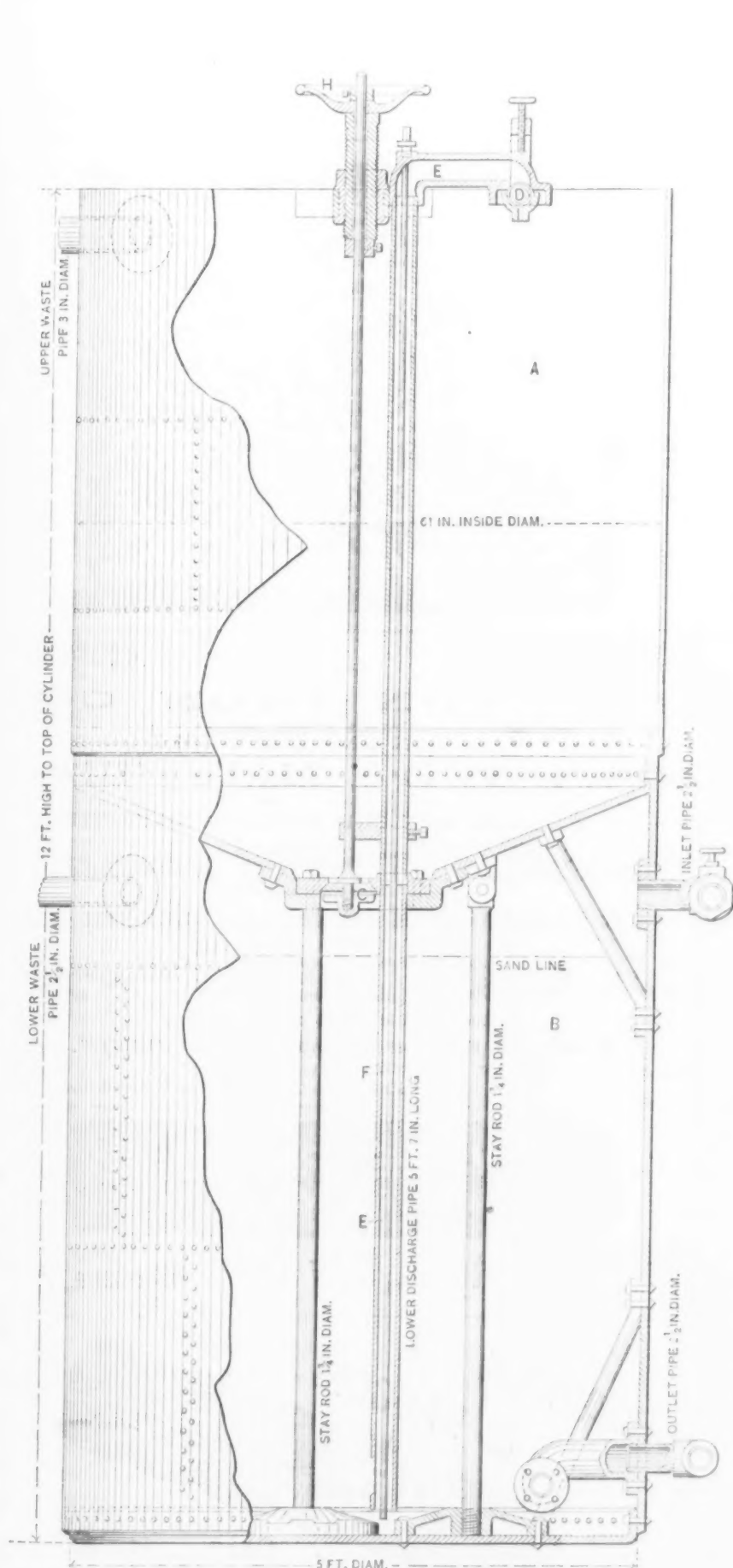


Fig. 2.—Vertical Section of Filter.

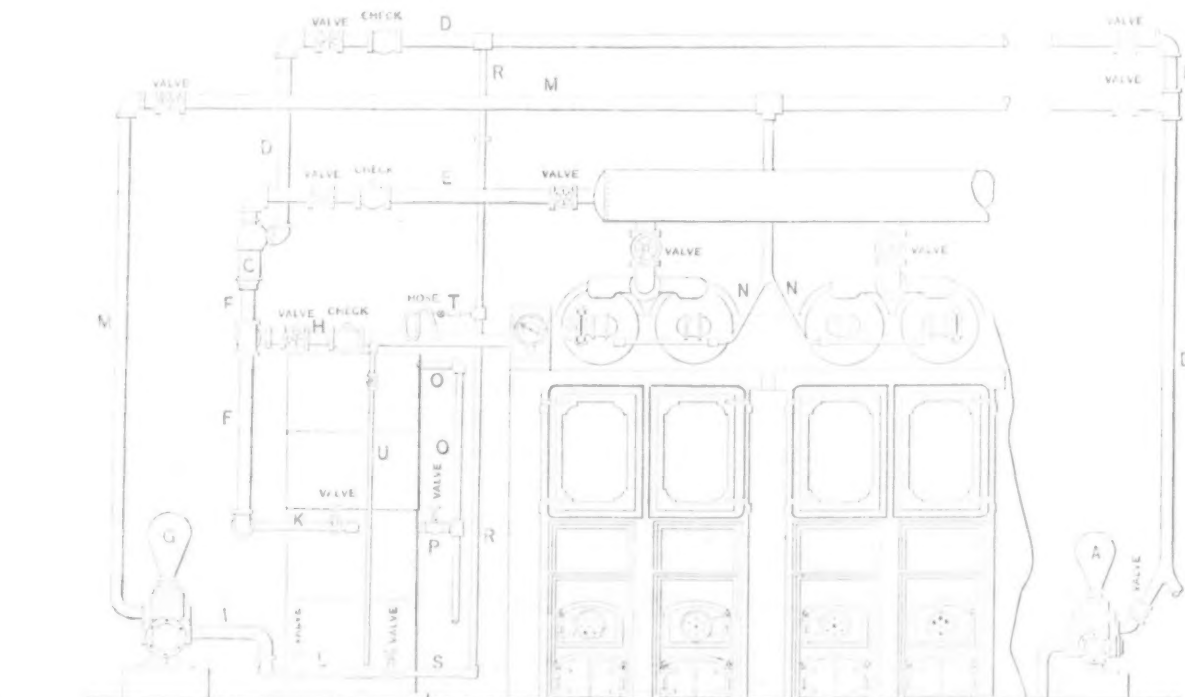


Fig. 1.—General View.



Fig. 5.—Section of Feed-Water Heater.

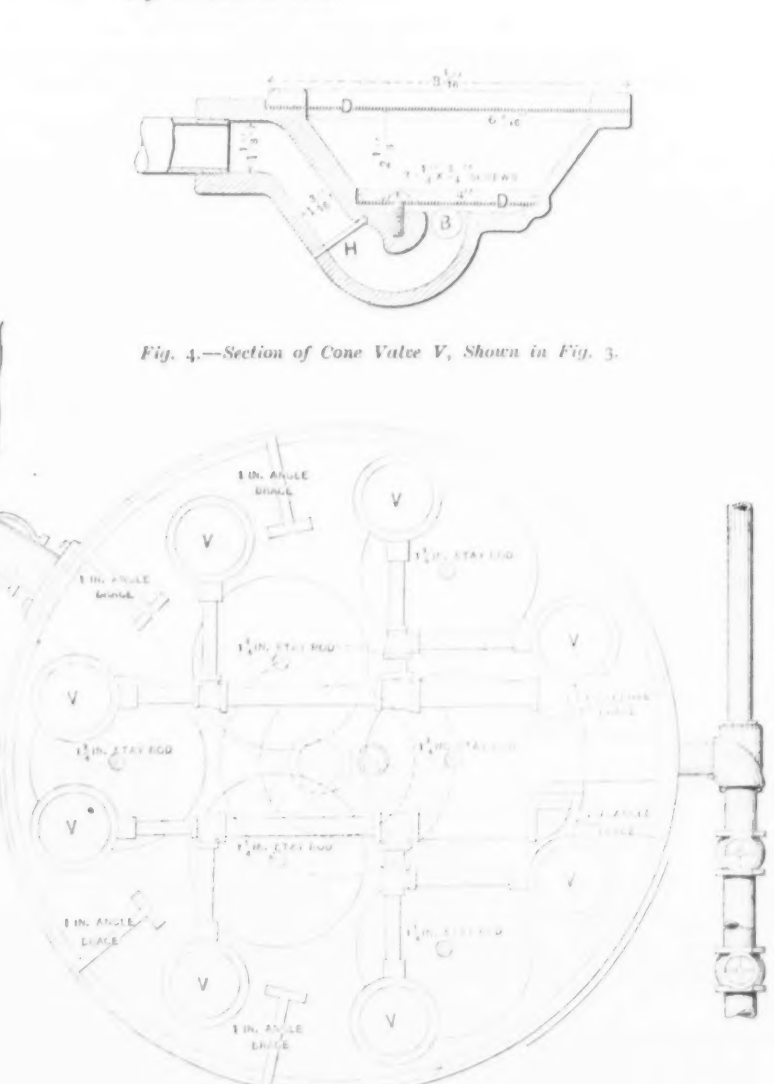


Fig. 3.—Transverse Section.

HYATT FILTERING AND CIRCULATING PLANT FOR STEAM BOILERS. DESIGNED BY THE NEWARK FILTERING COMPANY, NEWARK, N. J.

One of these we illustrate in detail on this page, and have no doubt that a careful study of the arrangements adopted and of the theory of the system will prove both interesting and profitable. In a general way Mr. Hyatt's circulating system can scarcely lay claim to novelty of conception, as the plan of effecting purification of water in a steam boiler by maintaining constant circulation of the water through exterior pipes from one level to another has been tried at various times, though often with indifferent results. Mr. Hyatt, however, has succeeded in putting the idea into a practically successful and modified form, and the results which have been

cold water, as, for example, sulphate of lime, or being held in solution because of the presence of some chemical agent which is driven off by heat. This is true in the case of carbonate of lime, which is held in solution by the presence in the water of free carbonic acid. If allowed to settle, as these impurities naturally will in a boiler not provided with means for their removal immediately on having been separated, they will form the deposits with which steam users are all familiar. Mr. Hyatt accordingly designed a system of pipes in combination with a filter through which the water from the boiler constantly circulates, and in which a large proportion of the impurities,

which represents a diagram of the feed and circulating pumps, pipes, filter and a battery of boilers. We show only one of two feed pumps, A, which supply the water for the boilers through the pipe D. This pipe, it will be observed, passes over the boilers to the left, and delivers the water to a heater, C, of which a section is shown in Fig. 5. The cold water enters through the horizontal branch F, shown in that figure, while through the vertical branch C comes a supply of high-pressure steam from the boilers. The pipe C is fitted with a closely wound brass spring, A, secured at its upper end by a brass pin, and furnished at the lower end with a plug. The steam coming

separation of the impurities thus going on to a great extent outside of the boilers. After passing from the heater and precipitator C the feed-water meets the circulating water from the boilers, flowing through the pipe H, Fig. 1, into the pipe F, and thence into the filter, where all suspended particles are retained. From the filter the water is conducted through the pipes L and I to the circulating pump G. This pump is the agency by which less than boiler pressure is produced at or in the heater F, and thus allows the steam to enter. The pump has double the capacity of the feed-pumps A, and consequently takes from the boilers the balance of its capacity. In other words, half the

from the boilers on about a level with the second gauge cock. The impurities, such as the sulphates, which are left in solution in the water after having passed through the heater C enter the boilers, where they are rendered insoluble, and in a state of suspension are carried by the circulating water to the filter, where they are held.

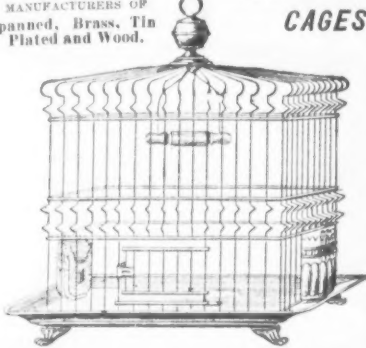
Of the filter proper we supply a vertical section in Fig. 2, and a cross section in Fig. 3. Its design is there so clearly shown that very little further explanation is necessary. The filtering material, which consists mainly of sand, of course, requires occasional

(Continued on page 19.)

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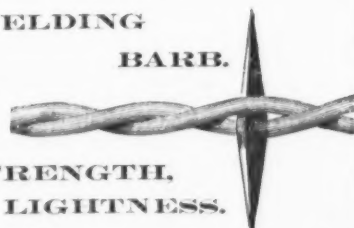
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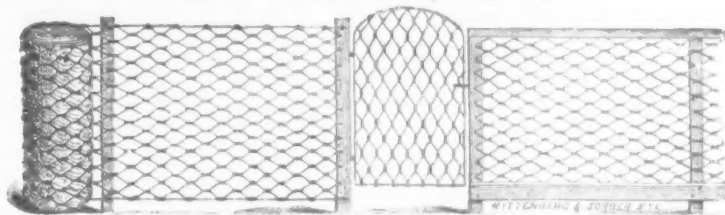


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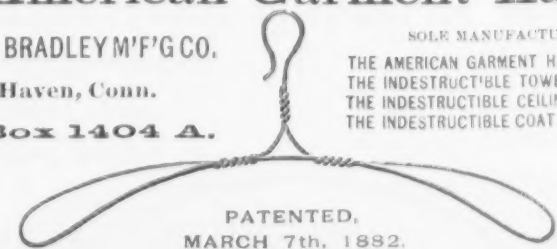
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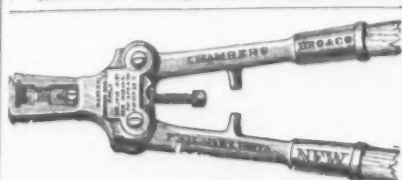
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
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




































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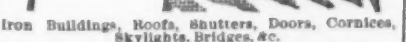
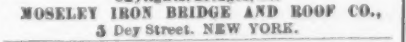
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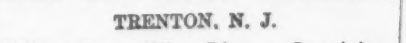
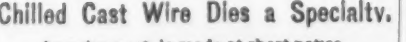
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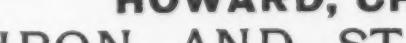
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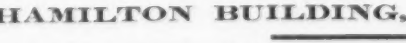
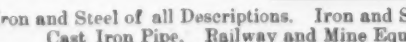
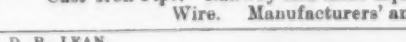
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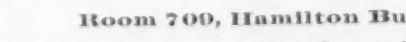
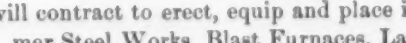
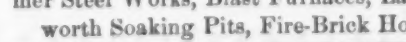






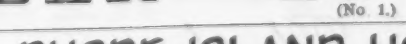





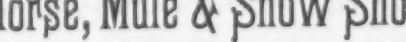



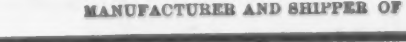






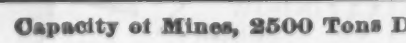
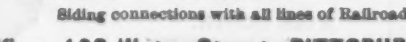


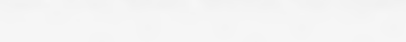
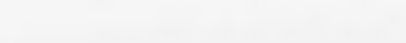







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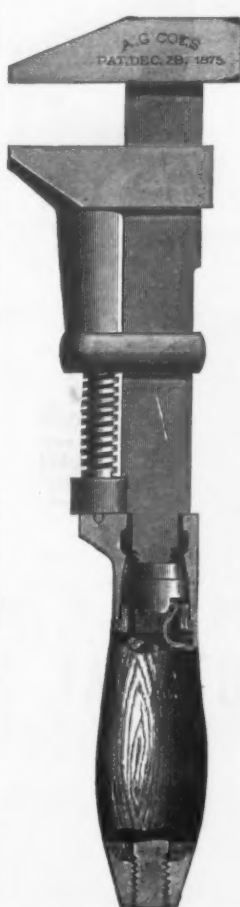


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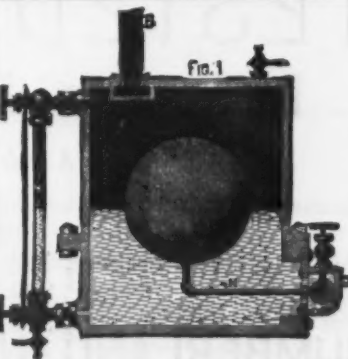
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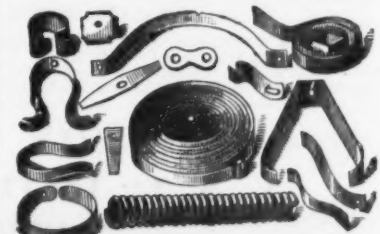
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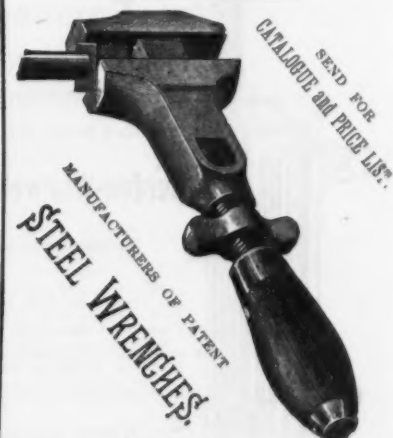


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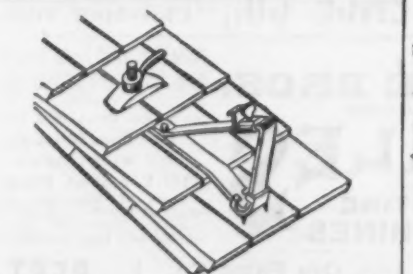
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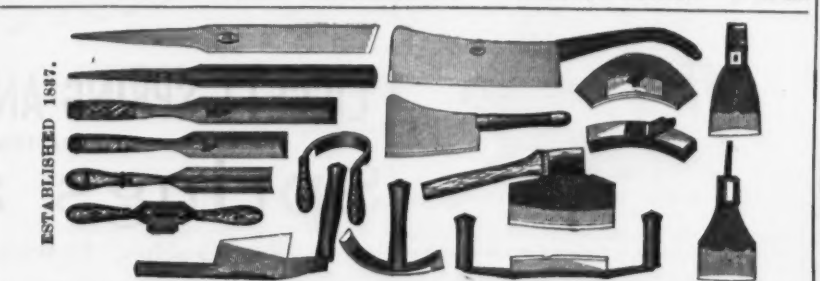
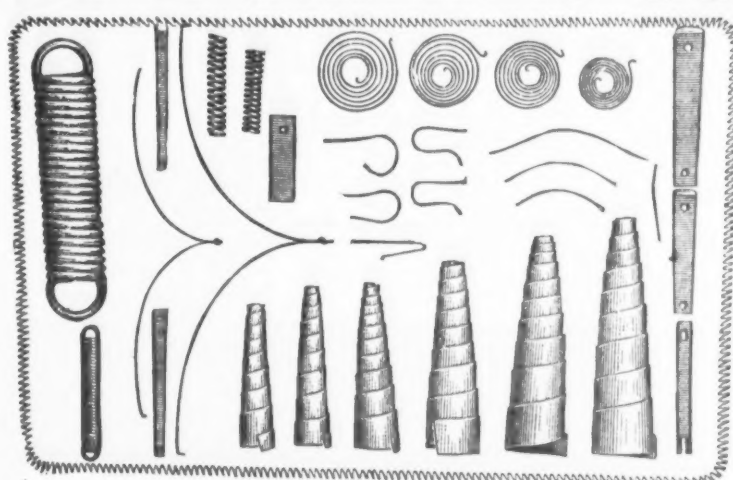
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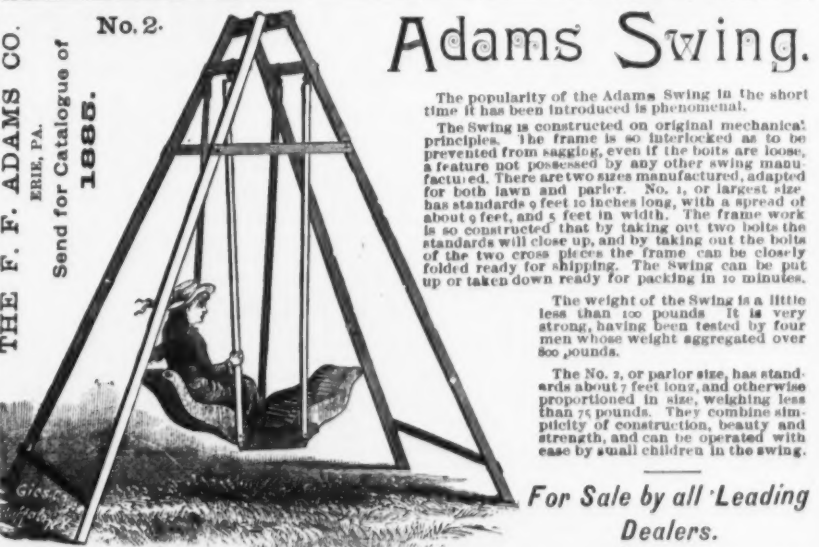
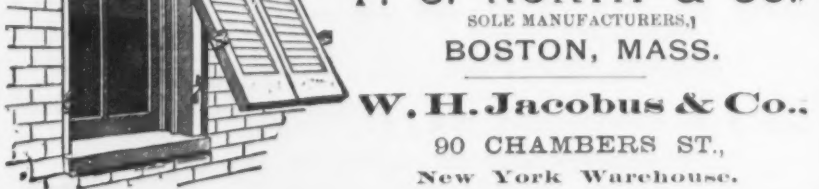
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WEYMOUTH'S PATENT.

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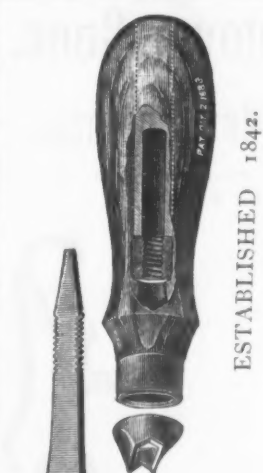
CAUTION.

We are informed that various parties are infringing upon the widely-known Letters Patent granted originally to GEORGE F. WEYMOUTH for an improved Hay Knife. The invention patented to GEORGE F. WEYMOUTH is embodied in a sword-shaped blade provided with operating handles for working the same, the edge of the sword-blade being furnished with knife-edged serrations or teeth. IT IS OUR PURPOSE TO PROSECUTE ALL INFRINGEMENTS, and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts. All manufacturers and dealers are hereby warned of our rights, and the public are cautioned against purchasing any Hay Knives, made as described above, which are not of our genuine manufacture. EAST WILTON, Sept. 1, 1886.



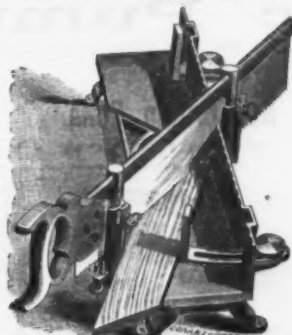
North Wayne Tool Co.,
 HALLOWELL, MAINE,
W.H. CARTER'S PATENT NEEDLE HAY KNIFE.
 PAT. APR. 29, 1884.
 IMPROVED BY M.M. BARTLETT.
 Improvement Patented April 28, 1885.
 SOLE MANUFACTURERS OF **NEEDLE HAY KNIFE,** THE BEST IN THE WORLD.
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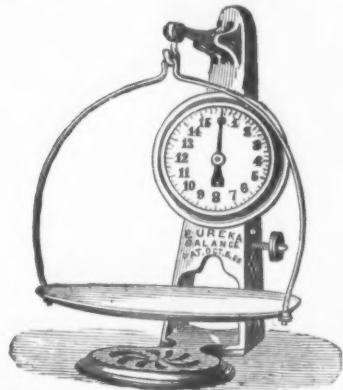
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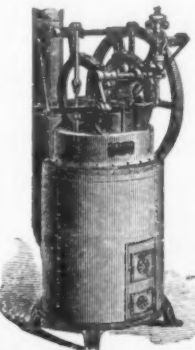
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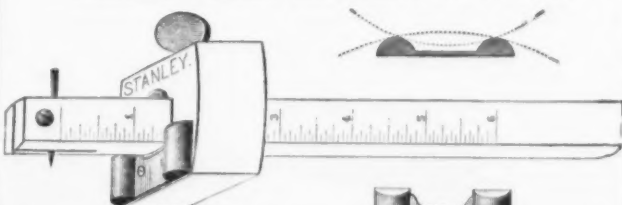
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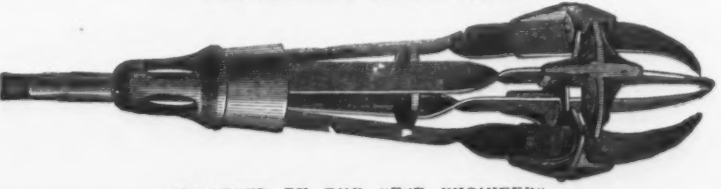
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washing, and this may be readily effected without in any way disturbing the operation of the other portions of the plant. To accomplish it, the valves in the inlet and outlet pipes, K and L (Fig. 1) of the filter to be washed, are closed, and the valve in the pipe S is opened. Water from the feed pumps A then comes directly through the pipe R, enters the filter under the filtering material, passes up through it, agitating and loosening the filter bed, and producing pressure which forces the filtering material through the pipe E (Fig. 2), the clamp and ball valve D at the upper end having been opened, and discharges it into the upper of the two compartments, into which the filter is divided. This compartment A should previously have been filled with water. The filtering material, being heavy, settles immediately to the bottom, and displaces the water which flows out through the upper waste-pipe, marked O in Fig. 1, carrying with it the impurities. The discharge pipe E in Fig. 2 is furnished with a loosening rod F, extending through the whole height of the filter.

After all the filtering material has been discharged into the compartment or tank A, the valve in the pipe S (Fig. 1) is closed, and the valve in the lower waste pipe P is opened. In addition, a valve C, arranged in the bottom of the tank A (Fig. 2), is opened by means of a hand wheel, H, at the top of the filter. The filtering material then settles back into the lower compartment B, at the same time being subjected to a second washing, as the lower tank would have been filled with water while discharging the sand into the upper one. The falling material, as in the case already described, displaces the water which flows off through the lower waste pipe (P in Fig. 1), carrying with it any impurities not removed by the first washing in the upper compartment. After the filtering material has all settled back into the compartment B, the seat of the center valve C should be washed off by means of a hose attached to the pipe R (Fig. 1) at T. After closing the valve C and also the valves in the waste-pipe P (Fig. 1), and in the pipe S, and opening the valves in the pipes K and U, water passes through the filter, up through the pipe U, into the tank A (Fig. 2). After this tank has been filled, ready for the next washing, the valve in the pipe U should be again closed, and the valve in the outlet-pipe L opened. The filter will then again be ready for regular work. It will be noticed in Fig. 1 that convenient shut-off valves are provided at different points in the pipe system. In Fig. 4 we show a sectional view of one of the outlet-valves, of which there are eight arranged at the bottom of the filter. These are marked V in Fig. 3. These "cone-valves," as they are called, are furnished with two perforated metallic diaphragms, D D, the space between the two being filled with copper shot. The small ball valve B, it will be observed, does not completely close the channel immediately under the lower and smaller diaphragm, but is designed only to throttle the flow of water upward when the filter is being washed, so as to compel an equal quantity to pass through each cone. In the ordinary filtering operation, when the flow of water is downward through the diaphragms D D, this valve B rolls into the pocket H, leaving a free passage for the filtered water. A pin, shown in the engraving, prevents the ball from rolling further and choking the outlet.

In actual work Mr. Hyatt's system, we understand, has given excellent results. A circulating and filtering plant of the same general character as that which we have described is under consideration for use on locomotives. The filtering material consists of two parts of coke and three of sand, all carefully sifted.

Twin Screw Torpedo Boats.

From a long and interesting paper on "The Twin Screw Torpedo Boats Wiborg and Destructor," read at the recent annual meeting of the British Institution of Naval Architects, we take the following:

The Wiborg was built at Clydebank for the Russian Government. The conditions laid down were: 1. Speed to be 20 knots per hour upon two trials, each of three hours' duration. 2. The weights on board at these trials to be a load of 15 tons, representing armament, torpedoes, stores, men and equipment, and an additional 14 tons of coal, or 29 tons in all. 3. Between the two full-speed trials a consumption trial of 12 hours' duration to be made, to show that the vessel could steam 1200 knots at a speed of not less than 10 knots per hour. 4. The armament to consist of two five-barreled Hotchkiss 47 mm. revolving cannon, with 500 rounds of ammunition to each gun. 5. The torpedo tubes to be three in number, two through the bow and one on deck, each 19 feet long. 6. Metacentric height to be not less than 1.75 feet. 7. The pumping power to be sufficient to eject at least 520 tons of water per hour, independently of the pumps for surface condensers. 8. The bunker capacity to be sufficient to give vessel a radius of action of at least 2000 knots at 10 knots. The dimensions selected to fulfill these conditions were: Length on water-line, 142 feet; beam molded, 17 feet; depth at middle of deck, 9 feet, 6 inches. The total complement of the boat is 22, four of whom are officers, and are accommodated in the after part. The clear deck area per man for the 18 men is 9 square feet, and the space per man is 120 cubic feet. The living compartments are placed in communication with the forced draft fans, so that as long as the stove-hole ventilators can be kept open, these compartments can be well ventilated. The condition of lightness of hull and machinery which must be fulfilled in order to obtain the high speed desired, taken in conjunction with the conditions as to subdivision and habitability already mentioned, make the percentage of surplus buoyancy very high, and consequently a vessel of this character is very lively in her motions. This liveliness is not compatible with comfort, and consequently tends to detract from the habitability of the vessel. The results of the consumption trial showed that, with

the 45 tons of coal which the bunkers would hold, the vessel had a radius of action of over 4000 knots.

The results of her behavior at sea, as reported by her commander, showed that she could safely go through heavy weather, but whether her crew could remain in working condition long enough to traverse 4000 knots at 10 knots, which would be about 17 days, can only be determined by continued trials. On her speed trials, details of which are given at the end of this paper, she attained 19.96 knots with nearly 41 tons weight on board, and she attained 20.6 knots with nearly 34 tons weight. These speeds are the mean of the speed on the three hours' run as deduced from the revolutions. At a later trial, with bunkers full and all stores and equipment on board, ready for sea, she attained a mean speed of 18.55 knots. The total weight on this trial was about 70 tons. Both these vessels were lighted throughout with incandescent electric light, and had a search light of 12,000 candles. The Destructor was built for the Spanish Government, and is a vessel 192 feet long on water line, 25 feet beam, and 12 feet molded depth. Her displacement fully equipped for sea, but with coal sufficient to steam 2050 knots, is nearly 400 tons. The conditions to be fulfilled in this vessel were similar in character to the Wiborg: 1. The speed to be 22½ knots per hour upon two trials, each of which to be of three hours' duration. 2. The load at the trial to be 43 tons of stores, outfit and equipment, 37 tons of coal, and 8 tons of fresh water for boiler service; a load of 88 tons in all. 3. Consumption trial of 12 hours, to show that 37 tons will drive a vessel at least 1500 knots. 4. The armament to consist of one 9 cm. gun, four 6-pounder rapid firing, two 47 mm. revolver, Hotchkiss, five torpedo tubes, two in the bow, one in the stern, and one in each broadside, each 15 feet long. 5. Metacentric height not less than 3 feet. 6. Pumping power to be 2000 tons per hour. 7. Bunker capacity to be sufficient for radius of action of 3500 knots. The vessel is divided into 39 water-tight compartments. The engines in this case are in two separate engine rooms, and the boilers are in four separate compartments. Coal protection is afforded round the machinery and the boilers by the bunkers; but in addition, abreast of the engines, the bunker bulkheads are formed of steel plates ¼ inch thick, which are placed there to protect the machinery from machine gun fire. Forward of the boilers and magazines is placed a curved bulkhead 1½ inch thick to give protection from raking fire.

This vessel, at her trials on the Clyde, attained a mean speed of 22.56 knots for three consecutive hours. The mean I. H. P. developed was 3784 and the mean revolutions of the two engines 292. On a subsequent three hours' trial the mean speed was 22.68, the I. H. P. and the revolutions corresponding being 3829 and 292.3. At the consumption trial the vessel was run at a mean speed of 11.6 knots for 11 hours, on a total consumption of 57 cwt. This was obtained by using only two boilers, and the result corresponds to a radius of action of 4929 knots at 11.6 knots. The mean I. H. P. over the 11 hours was 297, so that the consumption corresponds to 1.05 pounds per I. H. P. per hour. The consumption of coal at the full speed trials, which were made with a mean air pressure of 2¼ inches, was 2.4 pounds per I. H. P. per hour. There is no doubt that a much lower rate of consumption per I. H. P. per hour was obtained between these two speeds, but no means were taken to measure it. The consumption at full speed is not as high as might have been anticipated, and it gives the vessel an estimated steaming power of 540 miles at 20 knots. As a matter of fact, she ran on January 24 and 25 from Falmouth to Murus—just beyond Finisterre—in 24 hours, a distance of 495 knots, which is at a mean speed of 20.625 knots. The Wiborg has compound engines, working at 130 pounds boiler pressure. The Destructor has triple expansion engines, working at 145 pounds. From an estimate of the weight of steam used per I. H. P. per hour in these two cases, taken from a considerable number of diagrams, it appears that in the compound the consumption is 19.0 pounds, and in the triple it is 15.33 pounds, or a saving of 19.3 per cent. in favor of the latter, neglecting any advantage due to the small difference of pressure.

Rolled Steel Wheels.—On the 19th of April a patent was granted to Theodore W. Bean, of Norristown, Pa., for a method of rolling steel car wheels, consisting of giving the steel ingot the desired shape by means of two roll-heads whose shafts are journaled in housings, a third roll being provided, the periphery of which gives the shape to the tread of the wheel, which is moved by friction with the ingot. The two roll heads are driven by gearing, power being applied to one of the shafts. We are informed that working models have been made and are in operation at the Eagle Works, Newbold & Son, proprietors, Norristown, Pa. An organization is now being effected to build a plant to produce the rolled steel car-wheel, which, it is believed, can be produced at a cost not exceeding that of the cast-iron wheel now in general use.

An advertisement in which iron ore property in Virginia is offered for sale, contains the following analysis as an inducement to purchasers:

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Oxide of iron (Fe ₂ O ₃) in rhombic crystals	72.96
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Silica, &c.	4.23
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It is not likely that there will be a rush on the part of furnacemen for such an ore which bears all the characteristics of being part of the "iron hat" of a deposit of sulphides.

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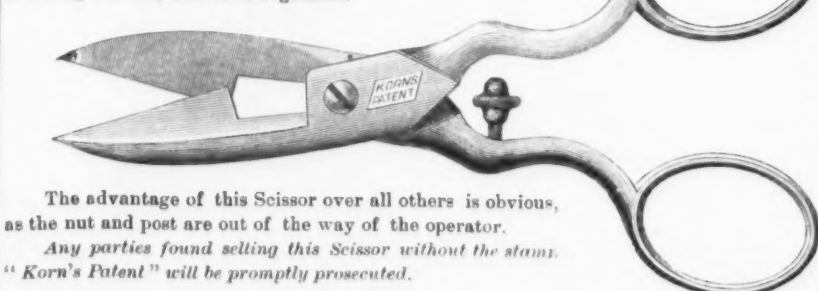
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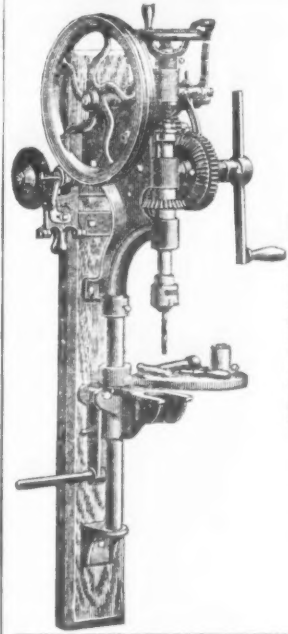
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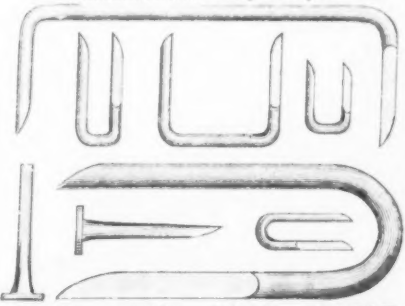
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823	- - -	1 1/4 "
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853	- - -	2 "
863	- - -	2 1/4 "
873	- - -	2 1/2 "
893	- - -	3 "

WITH STEEL SHACKLE.

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English Letter.

(From Our Regular Correspondent.)

LONDON, April 25, 1887.

THE SITUATION

In the metallurgical trades of this country cannot be truthfully said to have undergone much change in either direction during the past week. The continued feebleness of reports from the United States has served the "bears" very well, yet, on the whole, manufacturers have not been unduly influenced thereby, and have allowed the speculators to fling away values among themselves without being greatly startled. The very fine weather has to some extent sustained the iron and steel manufacturers in their views, inasmuch as it has been the means of stimulating several departments of trade which were badly in want of some such support. The better prospects of the agriculturists (who have not had so splendid a seeding time for many years past), the development of the London season, and the progress of the jubilee festivities arrangements have all had due and favorable effects. As matters stand, therefore, we are not any worse off than we were a couple or three weeks ago, while in some respects we may fairly claim to be a little ahead of the position we then occupied. Your market is being watched, although no longer relied upon, with much curiosity, especially as to the operation and incidence of the Interstate act. It is held in some quarters that the lull you are now experiencing is almost entirely attributable to that law, and consequently that when its true bases shall have been determined you will have a big rush. Telegrams relating to the projected enormous extensions of railways this year are regarded as being convincing evidence to the same end, so that it is just possible that there are some among us who are yet entertaining a "sneaking affection" for the good things which are to emanate from the United States. More cautious persons think the idea laudable, but just a little improbable. Our export trade, taking it as an entity, is not unsatisfactory, and compares well with that of last year; but it is complained in some quarters that the tendency is markedly in the direction of increasing shipments of crude material or goods upon which relatively little labor has been expended. It is held, therefore, that a good deal of the foreign business transacted is very little better than "giving change for a sovereign," with about as much profit as results from that money-changing operation.

The home market is only moderately good, and cannot possibly yield anything like its former results until agriculture is restored to something like its ancient prosperous condition. How that restoration is to be effected is a problem which is puzzling many of the farmers, chambers of agriculture and other similar bodies to discuss the consequences of foreign bounties and duties, preferential railway rates and many other points which are not improperly or unnaturally regarded as having much influence in keeping our farmers poor, irritated and hopeless.

The Royal Agricultural Society last year announced competitive trials this year, in July, at the Newcastle show, of traction, portable and other engines. In December last the leading agricultural engineers protested against these trials on the ground of the great expense and trouble they would involve. The society still persisted, however, and the manufacturers have now published their protest, nearly all the engine-making concerns having declined to take part in the trials. Some curiosity is felt consequently as to whether the society will resolutely proceed or whether they will "cave in" under the pressure brought to bear upon them. If they do go on some minor makers may win the prizes, whereas if the society gives way they will do so with some apparent, but no real, loss of dignity and prestige.

IN THE IRON MARKET

affairs, on the whole, do not show a more retrograde tendency than has been manifested for the last two or three weeks. Prices, comparatively, are not weaker, and, in addition, one or two encouraging features have characterized the past few days. For example, stocks in the public stores have not been increasing to the extent they were. Then, also, shipments have increased, and the records for the year, as far as it has gone, show a satisfactory advance upon those for the corresponding period of last year. Taking the market upon its merits, therefore, there is a fair prospect of a quiet, steady business, at tolerably good rates. Labor difficulties are still threatened, and further demands for increased wages have been made. Glasgow warrants have not excited much attention, and have generally declined, closing at 40/7 1/2 ton. In makers' brands a fairly good business has been done. Business has been done with Russia on a larger basis than has been recently the case, and the same remark applies also to Italy. On the West Coast matters remain precisely as they were, except that warrants have receded to about 42/6. Makers are not quoting for the time being, but nominally, mixed numbers approximate upon 44/6 @ 46/-. In Cleveland the business done has been small. The report that the recent speculative transactions are losing their influence has created a rather hopeful feeling. For No. 3 G. M. B. the ruling rate has been about 34/-. In Staffordshire some of the makers who, for several weeks past, declined to meet the views of buyers, have now shown a disposition for business, but the majority remain apparently indifferent. In the finished departments, and notably the lighter branches, no change can be reported, black and galvanized sheets have been in good request, and fairly satisfactory values have been realized. No falling off in bars, nail or wire rods has been reported, nor have angles and ties been less inquired for. Some of the works would like to be busier than they are, but for the most part there is not much cause for complaint. In the heavier departments the condition is not what could be desired, and several makers find a difficulty in keeping their works going. But this does

not arise so much from the lack of specifications as from the great and increasing competition with steel, which makers now have to meet. In old iron rails and scrap, business has been quiet, but prices remain firm, as before. F. Pitts & Co., London, quote— all c.i.f. New York or Baltimore: Old rails, 65/; heavy wrought scrap iron, 55/ @ 60/; iron fish plates, 67/6 @ 72/6, and leaf spring steel, 63/ @ 67/6. All values very irregular just now in this market. Freight for pig iron by ordinary steamer from Glasgow to New York continues steady at late rates. From Liverpool to New York and Boston, bars, sheets, and tinplates rule at about 7/6 per ton, and from the same port to Philadelphia bars and hoops are quoted at about 10/ and 10 1/2, and tin plates about 12/6 1/2 ton. On metals rates to New York from Liverpool are about 20/ and 10% primage 1/2 ton. Sheets and tin plates to Philadelphia are 12/6 and 10%. To Baltimore there are such indifferent returns the shipping companies prefer not to quote, as it does not pay to put a steamer on just now. From Swansea to Philadelphia tin plates are about 15/ 1/2 ton. Steel has continued in good demand but makers complain about the lowness of the rates ruling in the lighter departments. Bridge builders are reported busy, some exceptionally good orders having been placed lately. For the moment no fresh inquiries are before the market for steel sleepers, but it is understood that an important specification is about to be given out for an Indian railway. Blooms for the United States are quiet this week, and values are not so high nominally; about 75/ buyers and 77/6 sellers may be quoted. Steel rails have not been actively inquired for during the week. An order for 10,000 tons which has been hanging fire for some little time, for the United States, has now been given to the West Cumberland Iron and Steel Company, Limited. The price is understood to be c. i. f. on the Pacific Coast, near to San Francisco, for which place freights are not easy to determine. There is, however, good reason for stating that the price at the works will approximate to 24/ 5/ 1/2 ton. There are reports of other business having been done this week for the United States.

SCOTCH FIG IRON

is dull and flat, warrants being weaker on speculative selling by the bears and realizations by weak outside holders. They are 40/7, against 38/7 a year back. There are now 80 furnaces in blast—52 ordinary, seven basic and 21 hematite—compared with 97 this date 1886. In Connal's stores there are 863,427 tons, as against 734,715 tons a year since, last week's additions being 2310 tons. Shipments to date are 114,232 tons, or 13,046 tons more than up to the same date last year. Imports of Scotland have been 104,304 tons this year, or 10,160 tons more than last year to same date.

MIDDLESBORO' FIG IRON

is a trifle better, if anything, but no change of real moment has taken place. Shipments are rather above an average, but the local consumption is poor.

HEMATITE FIG IRON

is nominally unchanged, but is being a good deal knocked about as regards warrants by the Glasgow speculators. There are 53 furnaces in blast on the West Coast, against 43 a year since. Stocks in stores only are 131,979 tons, or 56,514 tons more than at the end of last year. Pig-iron shipments have increased by 2224 tons this year—a large increase last week—while rail shipments are 56,514 tons better to date.

THE HARDWARE TRADES.

In London there is a palpable improvement in business, but that was to be expected, seeing that the London season is gradually growing busier. The few days of fine genial weather have wrought a wonderful change in almost every department, and not only has there been an increase of business, but a greater buoyancy is perceptible, and a more hopeful spirit exists everywhere. Since the fine weather began the large houses in the furnishing trades have felt its influence in a marked degree, and building operations are becoming so active that the trade in builders' ironmongery will soon feel the influence of the welcome change. In spring goods generally a fair start has been made since the holidays, and the total promises a good average season. At Birmingham a fair number of merchant orders for iron hardware, and especially hollow-ware tools and bedsteads, have been issued since the quarterly meeting last week, the demand being principally from the South American markets, India and Victoria.

TIN PLATES.

In London the market may be described as steady, with ordinary I C cokes 12/9 @ 13/7, f.o.b. Liverpool. There has, however, only been a moderate business done during the week, owing to the majority of makers asking 13/-. At Liverpool the tin plate market has been marked by extreme quietness. Buying for the States on anything like an extensive scale has apparently stopped for the present. There have been a few inquiries for some special lots, but not many lines of ordinary sorts have been booked. A little more has been doing in the Continental trade, but no really large orders have come to hand. The talk among the American buyers is still of lower prices. 12/6 @ 12/9 I C, Liverpool, is the present idea, and it is understood that some of the commoner brands have been done at 12/6 @ 12/7 1/2, while some fairly good brands are obtainable at 12/9 @ 13/-. In Bessemer steel cokes there is not much difference in prices, but there are a few more orders to hand. The minimum figure for these so far is 12/9 I C, though many good brands are offering at 12/10 1/2 and 13/ I C, and specialties at 13/3 @ 13/6 I C. Siemens-steel cokes are almost unchanged in prices at 13/6 @ 13/9 I C. The wasters in ordinary sizes of the three sorts of tin plates just referred to continue in great demand at 12/6 @ 13/ I C. The inquiry for charcoal tin plates is light. Prices range from 14/6 to 15/6 I C for ordinary sorts in both Bessemer and Siemens steel plates. For the better-class brands of best charcoal tin plates the prices range from 16/ to 18/ I C. Orders for terno plates are fewer this week, as usual. The large sizes in various brands are still quoted from 24/6 to 28/ I C, Wales.

H. D. SMITH & CO.,

Plantsville, Conn.,

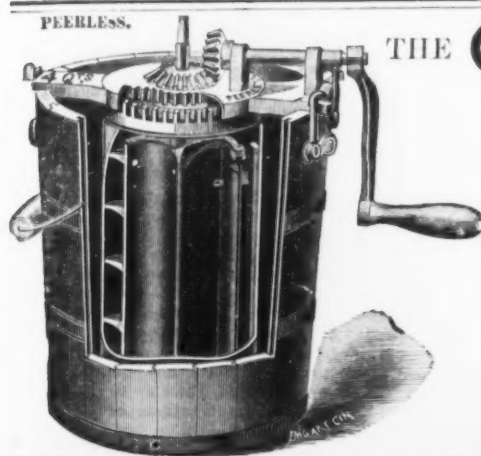
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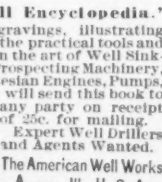
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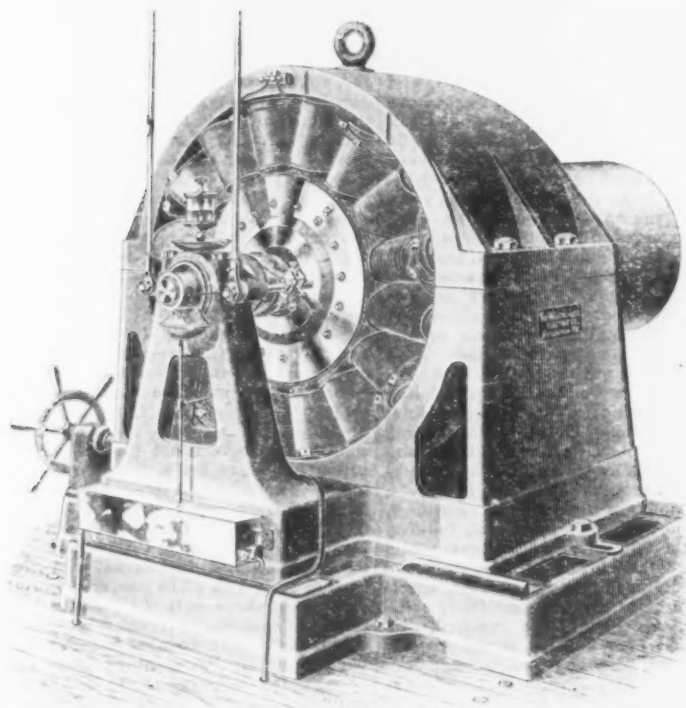
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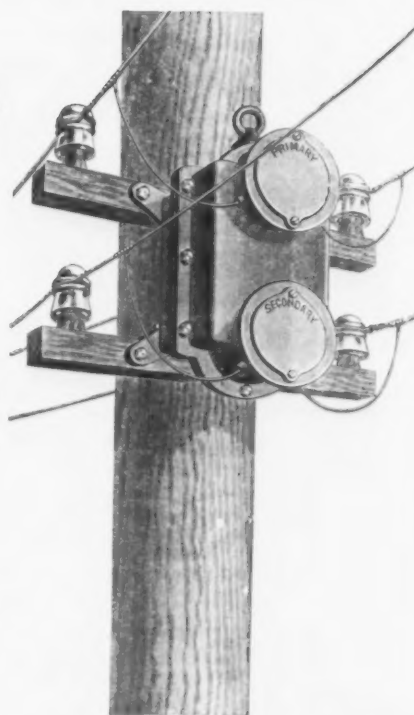
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THE WEEK.

Crude petroleum is being used as fuel in running a steamer on Chatanqua Lake. By the use of Lilley's invention the largest steamer there can be run between Jamestown and Maysville, 28 miles, with 4 barrels for the round trip.

Over 60 large propellers will be added this season to the fleet of grain vessels on the lakes, and many new canal boats will be launched.

An earthquake in the Santa Catalina Mountains, Arizona, on the 3d inst., is said to have brought to the surface an abundance of water, invaluable for farming purposes, and opened two large gold veins at a point where the side of the mountain slid down.

The Standard Oil Company are about to contract for the construction of an iron tank steamship for the coastwise trade, to carry 250,000 gallons in bulk. She will be 102½ feet long, 30½ feet beam, and 16 feet depth of hold, with triple expansion engines, steel boilers, with forced draft and all the latest improvements in marine engineering.

Blocks of marble weighing 14 tons are being raised 340 feet to their positions in the tower of the new City Hall building in Philadelphia.

The steamship *Allianza*, of the Brazilian Line, now makes all the ice needed for the use of the ship.

Cramp & Sons on Saturday laid the first keel plate for the new cruiser *Baltimore* at the yards in Philadelphia.

The St. Paul Pioneer Press says people in that community are beginning to understand that the "long haul" clause is an ingenious device to cut down the price of farm products and to break down the West, and that in the end the public will learn how much easier it is to get a bad law enacted than to efface the evil effects thereof.

The passage of a law requiring the periodical examination of all railroad bridges in the State by a competent engineer, is recommended by the Railroad Commissioners of Massachusetts, the results to be reported to the board.

The Pennsylvania Railroad Company proposes to construct an elevated railroad in Jersey City to cost, with its terminals, \$2,000,000, but the local government withholds its consent.

The Court of Appeals has affirmed the judgment of the lower courts in a case of much interest to builders and mechanics. A number of mechanics in this city who had not been paid for their work on a certain structure filed a lien on the building. Seven days before this lien was filed the owner gave what purported to be a deed, and which was recorded as a deed. It was shown on behalf of the mechanics that the deed was really a mortgage and that it was not properly filed. The lower courts decided in favor of the mechanics. The judges of the Court of Appeals have now affirmed the judgment of the lower courts, holding that mechanics who give their labor and furnish materials in the construction and erection of buildings must be protected, and that the owners of buildings cannot deprive mechanics of their rights by hiding behind mortgages which are not properly recorded.

The assessed valuation of Buffalo for 1887 is \$128,556,000, of which nearly \$9,000,000 represents personal property, an increase of \$6,186,000 over 1886.

Skilled workers are in demand at Castle Garden beyond the supply, and there are numerous applications for farm hands.

The steam steering apparatus on the Trenton proved a failure and then that of the Dolphin refused to work. It is now learned that the steering gear of the Chicago is utterly useless and will have to be replaced. The Chicago's apparatus is that of the Advisory Board. The Navy Department has already ordered a new steam steering apparatus for the Dolphin from Williamson Brothers, of Philadelphia, and its estimated value is \$3000. It will not be ready for at least a month, and in the meantime the Dolphin will be laid up at the New York Navy Yard.

A Canadian railway builder who has a contract to execute in Maine, is informed by the Treasury Department that his tools and implements are not entitled to free entry as "tools of trade, occupation or employment of persons arriving in the United States."

Secretary Whitney's auction sale of condemned naval material, at Norfolk, 24th inst., comprises a variety of machinery, steamship boilers, lathes, tools and hardware.

John H. Simpson, who had charge of the dynamo and electric apparatus in the Adams Express office, 41 Trinity place, was instantly killed when exhibiting his power of resisting the electric shock, which he said "did not affect him much any more." Putting each hand on a wire, he fell dead.

The Committee on Commerce and Navigation, in the New York Legislature, reported favorably to the Assembly the Hoysradt bill, giving the parties interested until 1890 to complete the Poughkeepsie bridge.

Marshal, Lefferts & Co., who have for many years been large dealers in galvanized and sheet iron, made an assignment to James

H. Fay on March 1 last. The next day the sheriff came in with five attachments merged in a judgment and held by Lissberger & Co. The claims aggregated \$10,000, and on Monday Deputy Sheriffs Delmour and Mulvaney sold about \$4000 worth of the assets of the defunct concern in satisfaction of one of the judgments, which was for \$3000, said to have been loaned to Lefferts & Co. the day before the assignment was made. About \$8000 worth of the goods of the concern are now in the hands of the sheriff, and have been put in storage.

Parties supposed to represent the Manhattan Elevated Railroad Company have contracted to purchase 600 lots above 155th street for rapid-transit purposes. The consideration is said to be \$3,000,000, of which \$100,000 were paid on Monday.

The New York Legislature will adjourn on the 24th inst.

The American Exhibition in London was formally opened on Monday. The bursting of a boiler, it is said, being "peculiarly American," was accepted as part of the regular entertainment.

Abram Steers's lumber yard, in Harlem, was destroyed by fire on Saturday night, together with some of the most valuable machinery used in the planing-mill business. Loss, \$100,000. Incendiarism is suspected.

The Supreme Court of Vermont has announced its decision in the famous case of the Ryegate stonecutters' conspiracy, growing out of the attempt of the workmen to prevent the employment of other workmen, and to deter them from working by denouncing them as "scabs," and threatening to make them publicly odious as such. The decision of the Supreme Court is that a conspiracy among workmen to prevent others from working or from being hired is a crime at common law, and punishable under the statutes of Vermont.

A poppy grower of many years' experience in Eastern countries is attempting to produce opium in Florida, which, he says, will yield \$1000 per acre under the improved processes of manufacture.

The Cotton Press Association of New Orleans, recently organized, claim to have obtained control of the cotton business in that city, and predict that reduced cost in handling will give a new impetus to trade in that center.

Colonel Haskin's Hudson river tunnel has again taken a fresh start, one more section on the New York side having been added this week, and the enterprising projector promises that one of the two parallel tunnels which have already been well advanced will be completed within 18 months. The iron plating and interior lining of brick were found to be well preserved. The entire length will be 5600 feet.

Sales of real estate in New York city since January 1 are computed to reach \$50,000,000, taking the figures of the Real Estate Exchange as a basis of calculation, although the sales recorded meanwhile in the Register's office are double this amount, of course including old transactions.

Contracts have been closed with Clyde builders within a few days for the construction of two first-class steamers for the Inman and International Steamship Company. They will be of the same general character as the *Aurania*, *Servia*, and other fast ships.

The Canadian Manufacturers' Association met in Toronto last week, and passed a resolution that unrestricted reciprocity in manufactured goods would be a serious blow at the commercial integrity of the Dominion, and that Canadian manufacturers are unanimously opposed to any treaty between the United States and Canada which would admit American manufactures into Canada free of duty.

The question is being considered by Mayor Hewitt, General Newton and others, who constitute a commission recently authorized by the State Legislature to inquire into the subject, whether another bridge to Brooklyn from New York City or a tunnel is most feasible. At a meeting in the Mayor's office last week General Newton said that he did not know whether there was any present necessity for the tunnel or bridge. Two miles of approach would be necessary for the tunnel. It might pay if it connected the Long Island Railroad with other railroads. Mayor Hewitt said that the commissioner could report to the Legislature that the bridge or tunnel could be built, but that, having no money to employ experts, they could not report the expense or feasibility. At the same rate of expense as the Erie and Lackawanna tunnels, this tunnel would cost about \$5,600,000, besides the cost of the right of way. A committee, headed by Commissioner Newton, was appointed to draft a report to the Legislature.

The importance of maintaining amicable trade relations between the United States and Canada was the subject of an address by Senator-elect Hiscock, of New York, in which he contended that the time is ripe for a measure of reciprocity which would benefit both countries and be a blessing to the 60,000,000 south as well as the 6,000,000 north of the lakes. Canada to-day, he said, is the third best customer the United States has, coming next after England and France. To the south of the United States are 50,000,000 of people; to them we sent last

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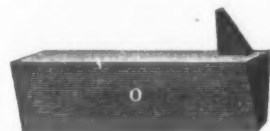
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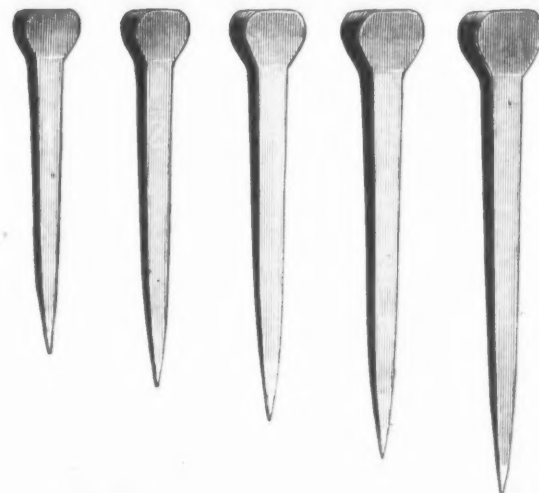
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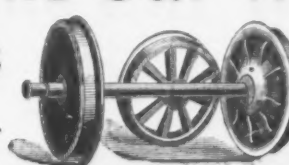
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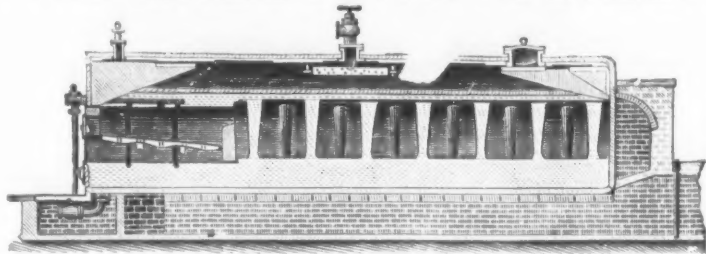
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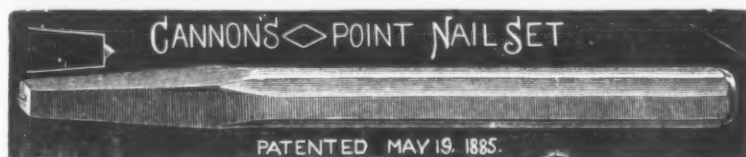
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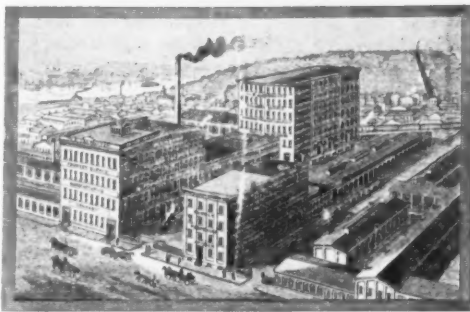
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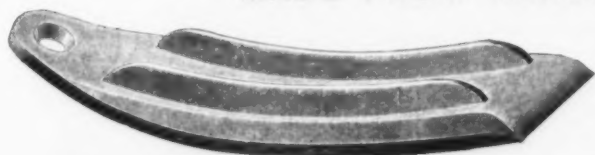
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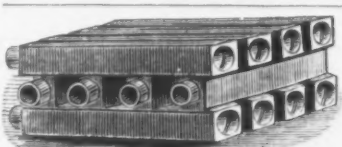
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year \$60,000,000 of goods. To the north of us are 6,000,000; to them we sent nearly \$50,000,000. The annual imports of Canada from the United States are to day more than from Great Britain. Under the reciprocity treaty of 1854 and during its term the balance of trade for manufactured goods was \$90,000,000 in our favor. How much greater would it be now with the great advancement made during the last 30 years. The Retaliatory bill might fully voice the sentiment, feelings and methods of a century ago, but is hardly consonant with the evidence of the broadening civilization of the nineteenth century.

The men employed in the erection of the new steel forging and armor-plate works for the Bethlehem Iron Company, at Bethlehem, Pa., were on Friday put upon 12-hour time, to hasten the completion of the buildings, so that work on the large Government contract can be commenced.

The corner stone of a "labor temple" of imposing dimensions will be laid in Minneapolis about May 22. The building, it is claimed, will be the first of its kind in the world, "built wholly by the efforts of workmen."

Two of the great pumps that are to exhaust the sewage from the trunk sewers in Newark have been put in operation. The great flume to Newark Bay has been built, and the sewage from the city sewers is now being lifted 17 feet into it by the big pumps and carried away. The cost of the work so far is \$500,000.

The Shah of Persia professes great interest in promoting commercial relations with the United States, and suggests that there are opportunities for railway construction in Persia which should attract American enterprise.

A report received at Washington from the United States commercial agency in London, Ontario, speaks of the disastrous effects of the Interstate law in checking both the import and export trades, and this is believed to be true of all points on the frontier.

Certain parties in Boston who wish to import a ready-made iron church edifice from England free of duty are informed by the Treasury Department that it cannot be done.

The Mexican *Financier* laments that the Argentine Republic is outstripping Mexico, not only in developing her internal resources, but also in extending her foreign trade. "The Argentines," it says, "may be going too fast, but at least they are thoroughly in motion."

The *Diario de Cienfuegos* says that owing to better cultivation and improved machinery, the yield of the cane has been gradually increased in Cuba during the past years to an extent that allows planters to-day to produce on some estates 1 hoghead of sugar with 650 arrobes of cane, while in former times 1500 arrobes were needed to obtain the same result. In the central factory "Sociedad," where the mills, filter presses, and all the other apparatus in use are of the best so far invented, the average obtained in manufactured sugar is 10.40 per cent. of the gross weight of cane, with good hopes of raising soon the yield to 11 per cent.

A scheme is on foot in St. Paul to reorganize the Northwestern Mfg. and Car Company with ample capital and no debts or liens.

The St. Louis trades union decided that no flag except the stars and stripes should be carried in public parade.

The Massachusetts Legislature makes Labor day in that State a legal holiday.

The New York Subway bill, extending the term of office of Commissioners Hess, Gibbons and Moss until November 1, 1890, after which their powers are to be vested in the Sinking Fund Commissioners, adding the mayor to the commission and legalizing the contract pronounced invalid by Judge Van Hoesen, passed the Assembly by a vote of 94 to 24.

A bill has been introduced in the Dominion Parliament in its principal features almost identical with the Interstate law, the main design being to prevent discrimination in the rates of freight.

A terrible explosion took place in the Vancouver Coal Company's mine in British Columbia on the 4th inst. Total number known to have perished is 189, of whom 82 were Chinese and 107 whites.

The State Department at Washington is preparing a report upon the restrictive and retaliatory features of foreign tariffs upon American products.

The Philadelphia Gas Works Construction Company have commenced an action in the Supreme Court against the Standard Gas Light Company, of New York, to decide the title to a patent hydrocarbon gas generator, to which plaintiffs set up an exclusive claim in that city.

Attorney-General O'Brien, of the State of New York, decides that the Legislature has power to regulate the price to be charged by grain elevators for storing and handling grain in course of transportation from the lakes to the canal, whether the business is conducted and the charges made by individuals or corporations.

President Adams, of the Union Pacific Railroad, who formerly paid \$85,000 every month to the Pacific Mail Company to keep up their rates of freight, avers in his state-

ments before the Interstate Commerce Commission that if compelled to obey the law a large part of the transcontinental business will be driven to the old water route across the Isthmus or around Cape Horn. The shipping interests, at least, would flourish under such an arrangement.

The jury in the suit of Lockwood & McClintock against Health Officer Smith and E. R. Bartlett & Co. for damages on account of the enforced disinfection of a cargo of furs imported by Bartlett & Co., returned a sealed verdict, giving \$8000 damages against the latter.

The Old Colony Steamboat Company have decided to add another large steamer to their fleet. The new boat will be a companion to the *Pilgrim*, though larger, and will be named the *Paritan*. She will have a double iron hull, and be fitted with compound engines of great power, with feathering paddle wheels. The new boat will probably be ready for the season of 1888.

The French steamer *La Champagne*, from Havre for New York, came into collision with the *Ville de Rio* soon after starting on her voyage, and was run ashore to save the lives of those on board, as her forward compartment filled, throwing the propeller out of water. The other steamer sank to the bottom. Only two persons are known to have been lost.

The new steel freight steamer *Worcester*, trading between this port and Bristol, England, has triple expansion engines which enable her to make 10 knots an hour with a consumption of only 18 tons of coal a day. She is 325 feet in length and has a capacity of 4200 tons dead weight of cargo. She is built on the double cellular principle, and has eight compartments.

The marvelous development of the natural gas business in Pittsburgh appears in the fact that a single company's gross earnings last year amounted to \$1,600,000.

Pent fuel is being used on locomotives in Northern Russia at a saving of about 50 per cent. from the cost of coal and wood used hitherto.

The budget speech of the Dominion Finance Minister, to be delivered to-day, is anticipated with deep interest on account of numerous proposed tariff alterations.

It has been stated that three Cunard steamers, purchased by the Canadian Pacific Railway Company, are now en route to Vancouver to take their place in the line to China and Japan. The service will be monthly, and the Home Government is asked to contribute \$300,000 per annum for its maintenance. The Canadian contribution has not yet been agreed upon.

San Francisco papers speak of the shipment from California last week of large quantities of wool via the Canadian Pacific Railroad from Victoria, and the Panama steamer took out 224,000 pounds, valued at \$53,000. The rate by the Canadian Pacific is \$1.50 to \$2 for wool.

The largest table ever made from a single plank belongs to the Illinois Club, of Chicago. The plank is 15 feet long and 6 wide, and was cut from a California red wood tree.

The case of the Fifth Avenue Bank against James B. Colgate, banker, of Wall street, seeking to hold him liable as a general partner in the firm of Humphrey & Co., which has been on trial for some days past in the Superior Court, ended on Friday in a verdict in favor of the bank for the full amount of its claim, \$11,990. Humphreys & Co. were leather dealers, and failed five years ago. Colgate claimed that the firm was a limited partnership, and that he, being a special partner, was not liable for their debts.

The report of the Commissioner of Labor Statistics for the State of Kansas gives a voluminous history of the Southwestern railway strikes of last spring. The immense loss, directly and indirectly, to the people, it says, cannot be accurately estimated, but the commissioner is inclined to place it at \$3,500,000 to the roads and \$1,100,000 to the strikers. He concludes: "Had the Kansas employees been free to act independently of those in the other States affected the strike would have been speedily settled, and I have reason to believe that in the future our railroad employees will be less disposed to extend their alliances beyond the limits of the State and more ready to try the efficacy of our own law providing for arbitration."

The Farmers' Alliance Cotton Congress, of Texas, assembled at Waco, and made arrangements for the extensive manufacture in that State of agricultural implements, cotton presses, oil mills, &c., and appropriated \$500,000 for the erection of a cotton mill. Over \$10,000,000 were represented.

San Francisco still holds her pre-eminence as a supply depot for the Pacific coast, compared with all other terminal points on the transcontinental routes. The State holds most of her trade against the rivalry of Vancouver, Portland, Los Angeles and San Diego. Last year the shipments east from various terminal points were as follows:

San Francisco	292,342,180
Los Angeles	49,652,030
Sacramento	45,085,610
San Jose	23,619,850
Oakland	13,112,710
Colton	6,329,940
Stockton	5,495,400
Marysville	3,848,820
Grand total	449,165,570

The Iron Age

AND METALLURGICAL REVIEW.

New York, Thursday, May 12, 1887.

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The Coke Strike.

From many points of view the strike in the Connellsville coke region is to be deplored. The first effort at arbitration in that great industry, which has suffered repeatedly from serious labor troubles, involving incidentally a great part of the Western iron and steel trades, has practically failed because the men declined to accept the arbitrator's award. With similar experience in the past in the Pittsburgh coal trade, employers in that district will hesitate a long time before they seek settlement through a method which is final only when it happens to give the workmen nearly, if not all, they expected. Nor does it appear this time that the leaders of the men loyally accepted the award to find themselves overruled by their fellows. It is true that a number of men supposed to be influential in the councils of labor in the Pittsburgh district have roundly denounced those who have put themselves at the head of the strike, but the fact remains that their broader views are unheard in the clamorings of the rank and file and the wild speeches of their direct leaders.

To the iron and steel trades the strike is of the gravest importance, since its effect will quickly be to cause a restriction of output of iron both in the West and East. In the latter section it will cut off the use of coke at a number of furnaces and cause them to use more exclusively anthracite as a fuel, thus limiting their capacity. In the West the effect will be far more serious. The furnaces in the Shenango Valley, the Pittsburgh and Wheeling districts, in Ohio and Illinois will be forced at once to run slowly to husband their fuel supply, and if the trouble continues they will be compelled to bank down. Some of the districts will not be affected, but nearly all the modern stacks throughout the West depend largely if not entirely upon Connellsville coke, with the exception of those who can conveniently get access to Kanawha coals. The aggregate production of these works is enormous, and while the heaviest part of their make is Bessemer pig, they produce also largely of foundry and mill grades. If continued for any length of time, the strike will inconvenience every rail mill, and nearly every Bessemer mill west of the Allegheny Mountains, with the

exception of the Colorado works. Some of them have been carrying a stock of pig or blooms, and others will seek relief in purchasing pig, blooms or billets. The demand thus created would tend to give new buoyancy to foreign markets and allow of further heavy imports at a time when American works had again succeeded in reconquering full control of our home markets. At the time when the Connellsville coke makers unduly advanced the price of that fuel, there was a chorus of protests on the broad ground that, by raising values of raw and, incidentally, of manufactured goods, foreign competitors were given a chance to raid our markets. Now the men are driving work abroad while they continue in idleness, and may force many men in allied industries to lose time.

Just before the strike, Bessemer pig, and to a less extent other grades, were showing signs of weakness in the West. That falling off may be soon expected to disappear, and should it be followed by a scarcity of raw material, continued over a period long enough to exhaust stocks, a rising tendency in rails, wire, nails, must develop. Founders would be embarrassed both by scarcity of their best fuel, and by shortage in stock. Muck bar and rolled iron would be affected, and since manufacturers of rolled iron would to some extent turn to old material, that, too, might develop strength which has long been lacking. Such are the possibilities suggested by any long-continued struggle in the coke regions. It is to be hoped in the interests of great American industries that there will be no prolonged battle. Some of the furnace companies have already granted the advance asked. Months ago the coke operators offered an advance of 5 per cent. "for the sake of peace." A repetition of that offer might avert what appears to us a very serious danger to the trade. In competing regions the manufacture of coke has been greatly stimulated by the active demand, and the remunerative prices of the past year, and a contest now would greatly aid them. The Connellsville coke makers can certainly afford now to make concessions to avoid general suspension of work. The contest for an equalization of wages with other districts must come later. The present time is not opportune.

Four Months of General Business.

If we except the confusion into which railroad freights have been thrown by the long and short haul clause of the Interstate Commerce law in April, the first four months of the year have been singularly uneventful in a general sense from a commercial point of view. The apprehended clash of arms on the Continent has fortunately been avoided through mutual forbearance, and with it a pretty general change of values of note on both sides of the Atlantic in the merchandise markets. While the uncertainties about this point lasted speculation was to a considerable extent checked, allowing most of the prominent articles to move on their own merits or demerits, yet coffee and india-rubber proved irrepresible from the moment the gloom vanished. Apart from iron, silver and copper, showing a fresh decline, and excepting hops of 1885, domestic products have, generally speaking, improved in value, cotton notably so. Among imported articles manila hemp has further depreciated, while sisal hemp has, on the contrary, approached the former, an apparent anomaly. Some 10 years since manila hemp was considered cheap at 14 cents, sisal then being worth about 5 cents, but the latter is now being better prepared for market in Yucatan, and begins to closely compete with manila.

We have prepared the following table in order to show at a glance the changes since the beginning of the year:

Course of Prices at New York During the First Four Months.

	Jan. 1, 1887.	April 30, 1887.
Antimony, Cookson's	\$0.09	\$0.09
Cocoa, Guayaquil . . . . .	.1395	.1385
Coffee, fair Rio . . . . .	.35	.37
Copper, Lake Superior . . . . .	.1175	.10
Cotton, middling uplands	9.9-10	.1085
Flour, extra State No. 1	4.25	4.25
Wheat, No. 3 . . . . .	.3015	.29
Indian corn, No. 2 . . . . .	.485	.4045
Hemp, Manila . . . . .	.0815	.0735
Hemp, sisal . . . . .	.0665	.0715
Hides, dry La Plata . . . . .	.3045	.30
Hops, best State, 1885 . . . . .	.15	.10
India-rubber, fine Para . . . . .	.28	.31
Iron, Am. pig No. 1	21.50	21.00
Steel rails, domestic	33.00	38.00
Lead, common domestic . . . . .	.0445	.0445
Spirits of turpentine . . . . .	.38	.3845
Nitrate of soda . . . . .	.02	.0225
Petroleum, refined . . . . .	.0615	.0695
Lard, refined . . . . .	.0645	.0715
Butter, choice dairy . . . . .	.27	.25
Rice, prime domestic . . . . .	.0445	.0435
Spelter, domestic . . . . .	.0445	.0415
Sugar, fair refined Cuba . . . . .	.0445	.0415
Tea, good cargo Oolong . . . . .	.31	.3017-32
Silk Italian raw No. 1	4.55	4.55
Wool, California spring . . . . .	.55	.57
Tallow, prime city . . . . .	.0445	.0435
Tin, Straits . . . . .	.92	.2965
Stearine, prime city . . . . .	.0735	.0845
Tin plates, coke	4.2745	4.31
Sheet zinc, domestic, 9 x 36 . . . . .	.0555	.0555

Now that inland navigation has reopened, it is to be presumed that the clause affecting railway traffic will find a speedy and satisfactory solution, and although the labor question again threatens to effect the natural expansion of domestic trade, we may soon be able to resume active dealings at home without much irritating local incumbrances. The elements underlying general trade with us certainly point to an absolutely sound condition. With no present danger of tariff tinkering, with the money market working evenly and heavy railroad earnings, are quite bright. It is too early to speak of crops, but we are aware that the rather severe winter

has wrought no damage to speak of, and that fruit also promises well. A reference to our table will show that prices of domestic goods, on the whole, continue quite moderate, and as the purchasing capabilities of the masses are ample, while stocks inland and in port are conceded to be quite manageable, further developments in the merchandise markets on this side are looked forward to with great confidence. Some are even sanguine enough to expect a "boom" in October.

Western Financial Centers.

Hand in hand with the rapid development of our natural resources which has characterized the past quarter of a century, the accumulation of capital has steadily proceeded. The seaboard cities were the first to reap the benefit of this movement toward financial independence, which has not been checked by panic or depression. New York especially became a center of activity for every branch of commercial enterprise, and national legislation assisted that city to secure and maintain financial supremacy. Under a recent act of Congress, however, the other large cities of the country have been given an opportunity to develop their advantages as financial centers. Cities having at least 200,000 inhabitants are now permitted to become "central reserve" cities on the petition of three-fourths of the national banks located therein. The national banks of such cities are required to keep a reserve of 25 per cent., but they are enabled to receive deposits from the banks of smaller cities and rural districts. While the banks of the central reserve cities lose some advantages, in being compelled to keep their reserve at home, and therefore deprive themselves of the chance to send such funds to other parts of the country and probably secure a high rate of interest, on the other hand, such large accessions to their banking capital will be received that they will be able to conduct a much more profitable business generally.

St. Louis made application some time ago to be put into the central reserve class, and now Chicago has taken the necessary steps. The action of these two great Western cities is of much importance in the financial world. It means that hereafter more capital will be available in the West for business purposes. It has already been announced that applications have been received from the banks of the following cities for permission to deposit in Chicago as a central reserve city: Milwaukee, Louisville, Cleveland, Pittsburgh, Cincinnati and New Orleans. This embraces a large territory, much of which has hitherto made New York its central reserve city. Numerous country banks will do the same thing. Some prestige may be lost by New York in this transfer of capital, but the country will probably be benefited by the division. Chicago now contains 18 national banks, which had on March 4th a total circulation of only \$767,060, but they had individual deposits amounting to over \$41,000,000, and country bank deposits amounting to \$35,000,000 more. One bank alone in Chicago carries a line of deposits exceeding \$20,000,000, being surpassed in that respect by but one New York bank.

In our issue of January 20 we published the results of what we believe was the first attempt to ascertain what proportion of the entire product for the second half of 1886 was Bessemer pig. The undertaking is beset by many difficulties, and we recognized in the course of that investigation the danger against which we had been previously warned that iron might be reported as belonging to that grade which in reality was not commercially so used. Those familiar with the trade know that furnaces are changed from one grade to another, and that iron made in at least one important district is used to an extent not generally known in the manufacture of Bessemer steel. There are few problems in the iron trade which statisticians should approach with more care than this, and yet we find in the last issue of *Bradstreet's* a somewhat pretentious effort in this direction, the general result of which is that we are now producing Bessemer pig at a rate greater by 10,200 tons a week than we were doing in December of last year. The following is the summary of the data collected, concerning which our contemporary modestly believes that they include all producers of note, with the single exception of the Cambria Company:

Weekly Production of Bessemer Pig.

States.	No. fur-	April, 1887.	Dec., 1886.	April, 1887.
Pennsylvania	47	25,490	20,185	17,725
Ohio	8	6,836	6,030	5,290
Illinois	13	13,250	9,530	10,600
Missouri	5	2,660	1,840	750
New Jersey	2	1,475	450	180
Wisconsin	3	659	555	555
West Virginia	3	1,460	1,820	1,985
Michigan	3	585	1,650	885
New York	8	690	460	810
Miscellaneous	7	2,910	2,670	2,185

Total Bessemer production reported to *Bradstreet's* 92 55,512 45,180 40,485
Total reported production pig iron of all kinds 353 137,528 127,660 104,867

We have enough evidence to pronounce these figures utterly untrustworthy and misleading. It would carry us too far to analyze Pennsylvania. In Ohio there are now more furnaces running on Bessemer than stated. In New Jersey, two furnaces working on that grade turned out close on 4500 tons in December, 1886, while the above table makes the capacity of them 350 tons a week, or at the rate of a little more than

1900 tons a month. Now, there are three now running on Bessemer with a capacity of 1350 tons a week, and not two, as stated. In Wisconsin the two Bay View furnaces produced in April nearly 6500 tons, or at the rate of over 1500 tons a week. Minerva blew in after the 1st of May. They did considerably better in March. The figures for Michigan will be puzzling to any one in the trade, and few will be able to enumerate the seven "miscellaneous" furnaces running on Bessemer pig, with a capacity of 2900 tons a week, when there are only two or possibly three stacks which would not naturally come within the States named, one in Colorado and one in Tennessee. While the make of Bessemer pig showed a tendency to increase during the first four months of the year, the increase has not by any means amounted to 10,000 tons a week.

Production of Iron and Steel in the West.

The recently issued statistical report of the American Iron and Steel Association presents an opportunity for the collection of some interesting facts relative to the progress of the iron and steel industry in the West. The year 1886 was a period of great activity in this section. As compared with previous years, therefore, the achievements of 1886 surpass anything that had been hitherto accomplished in that part of the country, while in complete harmony with the progress made in other sections. For the purpose of showing how rapidly the West is advancing in the manufacture of iron and steel, we have selected the census year 1880 as a basis of comparison with the production of 1886, using the statistics of the American Iron and Steel Association in both cases. We have also confined ourselves to the States of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa and Missouri, constituting the Central West, and embracing a tolerably compact section in community of trade interests.

With respect to pig iron we find that this section produced 1,757,739 net tons in 1886, against 1,197,604 tons in 1880. This is an increase of 47 per cent. As the production of the country increased 48 per cent. in the same time, it will be seen that the West held its own. Considering individual States, however, Illinois made wonderful progress during this period, advancing from an annual production of 150,556 net tons to 501,795 tons. Ohio also did well, having made 674,207 net tons in 1880, and 908,094 tons in 1886. Michigan also progressed from 154,424 net tons to 190,734 tons, but the other States in this group did not help to swell the increase. It may be observed that the States of this small section of the country turned out more pig iron in 1886 than the whole country was able to make in 1868, and only fell a little short of the production of 1871. And yet the country was presumed to have something of an iron industry in those days.

It is safe to say that in 1886 these Western States produced more steel than the whole country turned out in 1878, although statistics of the production of this section are not separately published. The State of Illinois alone made 535,602 net tons of Bessemer-steel ingots in 1886, against 304,614 tons in 1880, showing remarkable growth in this branch. The total production of steel in the Central West must have exceeded 800,000 net tons in 1886, against about 450,000 tons in 1880. The production of open-hearth and crucible steel is included in these latter figures, but there has been no special progress in this direction since 1880, although 1887 will show a renewed impulse, owing to the starting of new open-hearth steel works in Ohio and Indiana.

There has probably been a decline in the production of rails in the West since 1880, owing to the abandonment of iron rail mills, notwithstanding the great increase which Illinois is able to show. In 1880 the States of Ohio, Indiana, Illinois, Wisconsin and Missouri rolled 563,846 net tons of rails, but in 1886 they barely reached 550,000 tons. The production of Bessemer steel rails in Illinois in 1886 was 430,975 net tons, against 257,583 tons in 1880, showing an increase of over 67 per cent. This one Western State now makes as many steel rails in a year as the whole country turned out to years ago.

In the production of cut nails the Central West has more than doubled its record of 1880. In that year 1,404,763 kegs were made, against 2,863,317 kegs in 1886. The substitution of steel for iron is forcibly illustrated in this industry, more steel nails having been cut in 1886 than the entire production of this section in 1880, when not a steel nail was made. The nail production of 1886 was divided as follows: Steel nails, 1,580,950 kegs; iron nails, 1,282,367 kegs. Ohio and Illinois made far more steel than iron nails, while in Indiana and Wisconsin the reverse was the case. It is rather remarkable that Missouri and Michigan make no nails, being wholly dependent upon other States for their supply, although prominent in the manufacture of iron in other forms.

One other important branch of the iron trade remains to be considered—namely, the manufacture of various forms and shapes of iron commonly classed under the head of rolled iron, embracing bars, angles, shapes, plates, sheets, &c. In this line the West has merely held its own, having produced 606,188 net tons in 1886, against 609,675 tons in 1880. And yet two more States, Minnesota and Iowa, contained rolling mills in 1886. As the country at large, however,

made about the same quantity in 1886 as in 1880, a lack of progress in this branch casts no reflection upon the West. In fact, in view of the substitution of steel for iron, which has in late years made such rapid headway, it is remarkable that the production of rolled iron does not show a heavy decrease. Rails and nail plate, plates and sheets, structural shapes, car axles, pipe skelp, wire rods and hoops and bars—all acknowledge the sovereignty of steel, and yet taking one form with another the total tonnage of rolled iron to-day corresponds closely with that of 1880.

The figures we have given show the importance of the Central Western States as an iron-producing section of the country. But, large as the figures are, the current year will from present indications swell them considerably, owing to the completion of new works and also to the revival of old works which stood idle throughout the whole of 1886.

The returns of the Bureau of Statistics on our imports of iron and steel continue to show the heavy movement which is the outgrowth of the large purchases made during the rise last year and the earlier months of the current year. A glance at the table below, which gives in gross tons the quantities imported in the years 1885, 1886 and 1887 during the first quarters, will readily show where we have most exposed ourselves to foreign competition:

Imports of Iron and Steel for the First Quarter.

	1885.	1886.	1887.
Pig iron	218,400	212,663	80,020
Fig iron	93,190	71,695	26,089
Scrap iron	70,960	16,943	8,306
Scrap steel	7,181	1,600	843
Bar iron	6,996	4,820	4,219
Steel rails	25,147	1,048	1,048
Cotton ties	1,085	240	1,048
Steel hoops, bands, sheets and plates	4,806	553	276
Steel ingots, blooms, billets, slabs and bars	90,385	22,201	4,639
Sheet, plate and taggers iron	1,312	948	699
Tin plates	62,548	57,987	54,232
Wire rods	33,673	31,237	22,422
Wire and wire rope	643	805	206
Arms	429	191	110
Chains	163	187	180

It is well known that the freight engagements for May and June are very heavy, and it is likely, therefore, that we shall see a continuance of large imports throughout the second quarter, but beyond that the purchases thus far have been small—in fact, the entire new business done in pig, blooms, billets, rods, slabs, rails and old material has been very light for two months, so that possibly June, and certainly July, will show a quick decline in imports, unless meanwhile buying agents sets in. The only contingency likely to bring that about would be labor troubles on an extensive scale.

Condition of the Blast Furnaces, May 1.

As we foreshadowed when last reviewing the status of the blast furnaces throughout the country, there was a further increase in the output during April, with a tendency toward still higher figures at the beginning of the current month. It is well to state in this connection that often such an increase may prove more apparent than real, since it may happen that a few more of the great giants among the producers are running a few days earlier or later. The number of furnaces running has little or no significance, since the make varies within such wide limits. The status of the anthracite furnaces was as follows:

Anthracite Furnaces in Blast May 1.

Location of furnaces.	Total number of furnaces.	Number of furnaces in blast.	Capacity per week.	Number of furnaces out of blast.	Capacity per week.
New York	30	17	4,992	13	3,590
New Jersey	15	8	3,247	7	2,520
Pennsylvania	9	3	945	6	0
Lehigh Valley	48	41	13,044	7	1,790
Spiegel	1	1	50	0	0
Schuylkill Valley	44	38	8,598	6	2,510
L. Susquehanna Val.	55	39	9,587	9	2,073
U. Susquehanna Val.	18	11	3,084	7	1,300
Maryland	4	1	830	3	425
Total	190	137	43,802	53	13,948

As compared with former months we have the following:

	Furnaces in blast.	Capacity per week.
May 1	137	43,802
April 1	137	43,085
March 1	141	48,734
February 1	137	41,961
January 1	130	40,738
December 1	119	36,320
November 1	116	36,348
October 1	114	35,819
September 1	113	33,307
August 1	120	36,841
July 1	117	36,702
June 1	121	38,233
May 1	119	36,924

In New York the principal item of interest has been the blowing in of the first three of the Troy Steel and Iron Company's plant, on Bessemer pig, the only other change being the blowing out of one of the Manhattan furnaces for repairs. In New Jersey Chester went out, but has since again entered the list of producers. In the Lehigh Valley the second of the Allentown Iron Works' stacks has gone in after being remodeled. One of the Thomas furnaces was still out on the 1st inst. In the Lower Susquehanna region the Pennsylvania Steel Company now has three furnaces running on Bessemer, and the second Paxton has blown in on the same grade. In the Upper Susquehanna the Duncannon and one of the Montour furnaces are now idle.

The production of anthracite pig iron for the first four months is estimated as follows:

Production of Anthracite Pig, Four Months 1887.	
	Gross tons.
New York	69,005
New Jersey	6,797
Pennsylvania	212,580
Lehigh Valley	145,013
Schuylkill Valley	161,733
Lower Susquehanna	58,614
Upper Susquehanna	4,892
Maryland	
Total	715,324

The status of the bituminous and coke furnaces was as follows:

Bituminous and Coke Furnaces in Blast.
May 1, 1887.

Location of furnaces.	Total number of furnaces.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
Pennsylvania:					
Pittsburgh district.	18	17	16,600	1	550
Shenango Valley.	20	14	8,065	6	1,530
Juniata & Conemaugh.	22	17	7,967	5	970
Allegheny Valley.	15	14	13,846	1	690
Allegheny Valley.	15	14	475	1	115
Maryland	1	1	350	0	90
Virginia	12	12	3,346	0	835
West Virginia	3	3	1,751	0	397
Kentucky	3	3	863	0	0
Ohio:					
Mahoning Valley.	17	12	7,749	5	2,136
Hocking Valley.	13	9	1,531	4	1,024
Hocking Valley.	13	9	1,531	4	1,024
Miscellaneous.	15	12	8,084	3	1,509
Illinois	16	10	9,500	6	4,750
Missouri	2	3	1,535	5	1,965
Indiana	2	2	325	0	0
Wisconsin	3	2	1,514	1	365
Michigan	2	2	0	2	250
Alabama	12	9	4,359	3	820
Tennessee	9	9	3,995	0	0
Georgia	2	2	976	0	0
Colorado	1	1	550	0	0
Total	206	148	83,569	58	19,445

The total for May compares as follows with preceding months:

	No. of furnaces.	Capacity per week.
May 1, 1887.	148	83,569
April 1, 1887.	146	81,796
March 1, 1887.	146	79,682
February 1, 1887.	145	79,357
January 1, 1887.	137	73,422
December 1, 1886.	139	73,095
November 1.	140	73,013
October 1.	136	70,892
September 1.	135	69,306
August 1.	133	68,832
July 1.	132	71,810
June 1.	129	70,706
May 1.	129	67,888

There was, therefore, quite a striking increase in the capacity of the coke furnaces blowing on the 1st of May. Since then, however, two of the Edgar Thomson furnaces—E last week, and A this week—blew out for relining. The new Laughlin furnace went into blast on the 26th ult., on Bessemer pig, of which it will probably make between 1200 and 1500 tons a week when in full working order. We have credited it with a capacity of 1000 tons for May. In the Shenango Valley the Keel Ridge blew out on the 18th for repairs. The Rosena is not expected to start before June. In the Juniata and Conemaugh valleys the Cambria Iron Company now have all of the six furnaces at Johnstown at work on Bessemer, besides the two Blair furnaces and the E Conemaugh furnace on pig. In Maryland, Virginia, West Virginia and Kentucky there has been no change whatever. In Ohio the Steubenville blew in on the 21st ult., while in the Mahoning one of the Himrod and the second Hubbard furnace went into blast during the month. Anna furnace was still idle on the 1st, but has since resumed. In Illinois, Indiana and Wisconsin there was no change. In the latter State the Minerva began operations on the 3d of the month, making Bessemer pig. In Missouri one of the Missouri furnaces was in operation only during a part of the month. It is now idle, only one of the stacks running. In the South the plants are more generally busy than ever before, and the April product was heavy, with a prospect that the output will be even larger in May. In Alabama the Alice, Eureka and Sloss did very well, while the Woodward has again one of its stacks at work. Every plant in Tennessee was in operation during the greater part of April, and they all entered the month in full blast. The same is true of Georgia.

While this May promised to become the heaviest month on record in the output of coke pig iron in the history of iron making, the coke strike threatens to reduce the make heavily in the entire territory west of the Alleghenies and north of the Ohio River. It is quite impossible at this time to make any estimate of the decline in product, should pending differences not be settled during the current month. Even now one of the Pittsburgh furnaces is banked, and many others will in all likelihood follow suit quickly. Our figures, therefore, represent current capacity only if the strike is ended in a very few days.

We estimate the product of the bituminous and coke furnaces for the first four months of the current year as follows:

	Gross tons.
Pittsburgh district.	245,013
Shenango Valley.	134,743
Juniata and Conemaugh.	111,783
Allegheny and Youghiogeny valleys.	29,618
Maryland	2,600
Virginia	58,231
West Virginia	30,397
Kentucky	14,344
Mahoning Valley.	126,970
Hocking Valley.	24,198
Hocking Valley.	37,495
Miscellaneous Ohio.	125,282
Illinois	172,500
Missouri	39,841
Indiana	5,396
Wisconsin	24,192
Alabama	68,370
Tennessee	61,180
Georgia	14,626
Colorado	10,000
Total	1,321,418

If we add to this the make of anthracite iron, we reach a total product of both classes of 2,036,652 gross tons for the first third of the year, or at the rate of 6,100,000 gross tons per annum, which does not include charcoal iron.

The Stove Lockout.

During the past week the events connected with the great stove strike have been of peculiar interest. The impression which one gains from striving to keep advised of the news from various parts of the country from day to day, is a good deal like that conveyed by looking into a kaleidoscope. Every day turns the instrument and with each turn some new and surprising combinations are formed. For example, the three important foundries in Detroit have shut down in response to an agreement or demand, while those in Philadelphia, which promptly struck on the arrival of the objectionable St. Louis patterns, are now taking these patterns and going to work again. In many other respects the situation has changed in certain surprising ways, and while the whole position may be clear to those who are controlling it from the manufacturers' standpoint, it is certainly very confusing to students of the situation who are not in their confidence.

The surprise of the week is without question the lockout at Detroit. Following as it did a meeting held in that city last week, which was attended by the principal members of the National Defense Association, it looks very much as if the shut-down had been decided upon in response to a demand of the association, or as the result of a pressure brought to bear by it. We are not advised that the Detroit molders made any extraordinary or unusual demands, or that they gave any occasion to their employers for a suspension of operations. It was generally conceded that in continuing to run when most of the foundries in the country were closed up or more or less embarrassed by insufficient help, the Detroit foundries had a good thing; and while it is perfectly easy to understand why the trade at large should have desired them to close, it is not so easy to see why, having accepted in good faith the conditions imposed by the Defense Association and gone to work on the boycotted patterns, they should have considered it necessary or desirable to comply with the request of founders less fortunately situated, to join them in their misfortune. The object does not seem to have been primarily to break the molders' union, for at least one, and probably all, of the Detroit foundries were non-union shops, and however large the union membership among their men, the union did not control. Again, coincident with the closing at Detroit, we read of the general resumption of work in the Philadelphia foundries which are members of the Defense Association, and are under quite as much obligation to stop for the general good as the Detroit foundries can possibly be. It may even be assumed that they have less urgent reasons for running just now, but the fact of their starting up does not seem to produce any general consternation. This may be a question of district, but we fail to see that this is entitled to any great consideration, for the reason that the geographical location of a foundry no longer determines the area of its distribution. Taking all these facts into consideration, we think it no discredit to our editorial intelligence to confess that, for the first time since the strike began, the situation presents anomalies which we do not understand.

The business of the National Defense Association has been conducted with great secrecy. Notwithstanding the number of people who must be intimately advised of its movements, since its meetings have been largely attended, they seem to have succeeded uncommonly well in keeping their own counsel and preventing newspaper reporters from getting any information. How much of this success is due to the fact that a majority of those who have gone after this information have not known how to get it, and indeed have not been quite sure what they wanted to find out, we are unable to say. It is enough to admit at the present time that they, to quote the language of the old hymn, "move in a mysterious way their wonders to perform," and that nobody outside the membership seems to know just what they are trying to accomplish, or by what method they are seeking the results they are after. This may be very clever, but, like most clever things, it seems to be defeating its own object. It has given rise to the impression that the Defense Association is a combination to advance the prices of stoves by producing artificial scarcity; that to this end they are forcing the men into idleness all over the country, and that the game of battledoor and shuttlecock they are playing with the boycotted St. Louis patterns is merely a subterfuge to induce the men to strike, and so relieve the manufacturers of the moral responsibility of a lockout. The result is that a great many journals throughout the country which were originally in sympathy with the position of the manufacturers in opposing the demands of the St. Louis molders for an unreasonable increase in wages, and who applauded the Defense Association for standing by their St. Louis Associates, are now taking sides with the men and are rapidly withdrawing from the manufacturers the desirable support of public opinion. Much as we may deplore this result, we are not in a position

to avert it, since we do not feel at liberty to defend the present position of the manufacturers in the absence of a better knowledge of what that position is and to what it is likely to lead.

We think the Defense Association are making a mistake in not defining clearly the issue of this contest, and stating what it is they are contending for. If the situation and outlook in the stove trade are such as to forbid an increase in wages, they are perfectly right in sustaining the manufacturers who refuse to grant such an increase when it is demanded by the men. If the present stock of stoves in the country is so great that continued production by the leading foundries would tend to congest the market and invite a competition destructive of all profit, they are perfectly right in inviting the co-operation of all manufacturers in an effort to reduce production by a temporary suspension of operations. If the situation is such as to render it necessary that wages in the stove foundries should be reduced, the Defense Association have a perfect right to fix a lower scale than that which now obtains, and set in motion the means of enforcing it. In fact, in any well-defined position which had the warrant of an agreement of the manufacturers would give it, the Defense Association could count upon the approval and support of an intelligent public opinion. But their position is weak in that they seem to be fighting without any definite issue in view, and nobody knows whether what they are seeking to accomplish is just and proper, or wholly the reverse.

If the members of the National Defense Association know what they want, we think they owe it to themselves to define their position, so that it might be understood by the press and public. To this end it is not necessary that they should proclaim all their movements or betray the secrets of their councils, nor would this be expected. But since the strike has attained almost national proportions and entails more or less suffering to a great many thousands of people, it is not asking too much that they define clearly the issue which exists between themselves and the molders' union, and that they present an ultimatum which the men may accept or reject as they see fit. The association has a perfect right to defend the legitimate interests of the trade in any proper and reasonable way, and may even demand the emancipation of all the foundries in their membership from union control, provided they give reasonable assurance that the men who abandon the union will receive generous protection and fair consideration. If the facts warrant it, they may even say that the terms of peace are a recognition of the supremacy of the National Defense Association, and that, until its rules are subscribed to by the molders, the foundries in the membership of the association will remain closed. This, however, involves a clear definition of what the rules of the association are; and so far as these affect the men, if there be any they are absolutely unknown. In a word, it is, we think, time that the Defense Association abandon their present atmosphere of mystery and clearly state what they require, why they require it and for what issue they are contending. There is nothing undignified nor dangerous in conceding this much to a reasonable public demand, but by refusing it they invite suspicion, alienate public sympathy, and prejudice their own cause. This they cannot afford to do. The unanimous public sentiment which has condemned the sympathetic strike will, with equal emphasis, condemn the sympathetic lockout; and however strong the National Defense Association may be, it cannot withstand even a mistaken public opinion if, misjudging its position, it condemns it. A clear and distinct announcement of the demands of the National Defense Association would very much strengthen its position.

The *Railway Age*, the leading authority on the current statistics of railroad building in this country, has gathered data which justify its making the prediction that the complete record for the year will show an addition of at least 10,000 miles of new railway, with the possibility that it may reach 12,000 or 15,000 miles. Earlier in the year our contemporary put it at 8000 or 10,000, while Poor put himself on record with an estimate of 12,000 miles. Some doubt is expressed concerning the possible effect of the Interstate Commerce law. The earnings of the railroads thus far reported for April are certainly not discouraging to that interest. In fact, the opinion is gaining ground that the passage of the law was pretty generally seized by the railroad officials as an opportunity to advance rates, adopting the expedient of giving themselves latitude enough to come down. They are doing so now to a considerable extent, but even these are on a somewhat higher basis. So far as can be judged now the operation of the act will not be to discourage the building of branches and the paralleling which is going on West and South.

It is reported that the men at the furnaces of the Brier Hill Coal and Iron Company, Youngstown, Ohio, have struck for semi-monthly payment of wages.

Active preparations are now being made at Port Henry, N. Y., to put all the five furnaces in that section in blast.

Obituary.

W. C. DE PAUW.

Mr. W. C. De Pauw, one of the most enterprising manufacturers of the United States, died at Chicago on the 5th inst., having been stricken with apoplexy while visiting that city on business. Mr. De Pauw was a resident of New Albany, Ind., whose manufacturing industries were largely built up by him. He was born at Salem, Washington County, Indiana, in 1821. His father was Gen. John De Pauw, a native of France, and a member of a noble family, who became an eminent citizen of the pioneer period of Indiana. Gen. De Pauw was not able to give his son much of a start in life, however, but let him to become the architect of his own fortune. In 1844, when W. C. De Pauw was a poor man, he was elected clerk of the courts of Washington County, and from his savings in office he laid the foundations of his wealth. He entered the banking business in 1854 and became president of the bank of Salem. In 1861 he removed to New Albany, and became one of the heaviest contractors of army supplies in the West. He erected the large plate-glass factory at New Albany, and under most discouraging circumstances succeeded in establishing the business, which was new in this country, on a firm basis. Subsequently he became interested in the New Albany Rail Mill Company and the Ohio Falls Iron Works, as well as in woolen and cotton mills, foundries, and other manufacturing concerns at that point, at Louisville and at Indianapolis, being a large stockholder in the Indianapolis Rolling Mill Company. He continued his connections with the banking business, and at his death was interested in a number of banks in Indiana and at Louisville and Chicago. Born and reared in Indiana, and residing there during the whole of his life, he was probably its wealthiest citizen when he died. He was also its most liberal citizen, having given vast sums in charity and for religious and educational purposes. His donations to the Methodist church aggregate \$1,000,000, and his will provides for a bequest of not less than \$1,500,000 to De Pauw University, at Greencastle, Ind., to which institution he had already given over \$300,000. His sons are energetic and capable men of affairs, by whom his vast property will be prudently managed.

Tracklaying in the First Four Months of 1887.

The evidence which was presented one month ago that the work of railway construction during 1887 is to be very large is fully supported by the returns of tracklaying received in April. Our records now show that from January 1 to May 1 there have been laid in the United States no less than 1564 miles of new main track, on 65 different lines, in 29 of the States and Territories. This is an addition of 524 miles during the last month, and shows a total which has never before being equaled during the same period, with the exception of the first four months of 1882, when some 2300 miles of new track were reported. The total length of new lines for that year—1882—was 11,568 miles, by far the greatest mileage laid in any one year. During the first four months of 1886 our reports showed only 666 miles of track laid, although the total mileage for that year was about 8200 miles. There have already been laid this year about three and one third times as much mileage as was credited to the corresponding months of last year, and more than one-half as much as the new mileage for the entire year 1885. While the effect which the Interstate Commerce law will have upon new construction is still a matter of some doubt, we now feel warranted, after taking a survey of the entire field and noticing the great number of enterprises either in progress or projected, in venturing the prediction that the complete record for the year 1887 will show an addition of at least 10,000 miles of new railway, with the possibility that it may reach 12,000 or 15,000 miles. Indeed, the probabilities now seem to indicate that the railway building during 1887 will exceed that of any previous year.

Of the 1564 miles shown by our records more than one-half has been built in Indian Territory, Texas, Kansas and Colorado. Large additions are to be looked for in the next month or two in Dakota, Nebraska, Montana, Missouri, Wyoming, Oregon, Georgia, Alabama and Florida, as well as in the States already named. Indeed, in nearly all of the Northwestern, Western and Southern States numerous extensions are under way. In the more northerly part of the country where snow and frost have but lately disappeared the work of tracklaying has now begun, although, as has been suggested, extensive preparations have been made in large portions of the Northwest, and from this time until winter sets in every day will see the addition of many miles of steel track in States and Territories which still far do not figure greatly in the showing. In short, 1887 seems certain to pass into history as a year of extraordinary activity in railway building, and consequently of great activity and prosperity in the lines of industry which are intimately connected with that work.—*Railway Age*.

The Duluth and Northwestern Smelting Company have been organized at Duluth, Minn., with a capital of \$2,500,000, and will establish their large copper and silver smelting works, which are intended to be the largest in the country. This company consists of Detroit, New York, Boston and San Francisco capitalists. It is under contract with the owners of the Anaconda mines of Montana, to smelt their entire product, much of which had formerly been sent to Swansea, Wales. It is stated that the company will expend at once \$300,000 in the erection of works. It is expected that 1500 men will be employed.

We are informed by the York Iron Company, of Black River Falls, Wis., that on April 5 the railroads put up freights and caused nearly a total suspension of shipments of pig iron. Lower freights, however, have since been secured in some cases, and renewed movement of pig iron is the result.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., May 10, 1887.

The members of the Interstate Commerce Commission will return to Washington on Monday, and will resume their deliberations here. Their visit to the South has thrown much light upon the practical workings of a system of regulation of interstate commerce, which they will be ready to formulate by the time of the meeting of Congress. It is understood that they will make a visit to several of the more important railroad centers of the North for conference with railroad men and shippers. They find that this is the more effective method of getting at results than by the purely speculative treatment of abstract propositions propounded for the sake of drawing out opinions. It is understood that the Commission is disposed to make no more suspensions, but to allow the law to stand and to act upon a practical case of violation. In order to avoid the confusion resulting from a promiscuous submission of papers by railroads and industrial establishments a circular has been prepared requiring the transmission with all packages a statement of subjects covered. At present there is about a ton of papers which have not been handled for want of force. The time of the clerks has been used in getting matters into some sort of working order by the return of the Commission so that they may get down to business.

CARLISLE AND THE TARIFF.

The reference by Speaker Carlisle in his speech before the Kentucky Convention to the tariff issue is regarded among Senators, many of whom are still in the city, as serving notice that there will be a renewal of that issue in the next Congress, which will make it a prominent question before the people in the campaign rapidly approaching. It is not improbable that the position of Mr. Carlisle will lead to complications in his choice for Speaker of the next House. A movement was on foot, soon after the adjournment of the late Congress to secure some expression from him of his position with reference to the placing of a representative tariff Democrat on the Committee on Ways and Means. He declined, however, to give any intimations as to what he might do if re-elected. The Whiskey interests of the West will have much to do with shaping this matter. It will resolve itself into a question of the distillers as against the manufacturers. Mr. Carlisle and his friends will press every point, and with the weakening of certain Republicans in New England and the West, they may be able to compass their point of a reduction of revenues by means of a reduction of protective duties.

THE BETHLEHEM PLANT.

Secretary Whitney expresses much regret on account of his inability to go to Bethlehem to view the progress being made on the great plant for the manufacture of gun steel and armor plate under the contracts with the Government. Commodore Sicard, chief of the Bureau of Ordnance; Commander McCormick, inspector of ordnance at the Washington Naval Arsenal, and Civil Engineer Peary took their departure yesterday, and will report. The Secretary, however, has not entirely abandoned the idea of giving these works a personal visit, but hopes to be able to do so later in the season. He is taking a great interest in this work, and expects to secure enlarged appropriations from the coming Congress for additional ships and additional quantities of material. It now looks as if South Bethlehem will become the great center of manufacture of steel in every variety required by the Government for army and navy ordnance and armor for ships and coast and harbor defenses. The almost unlimited means and enterprise of the Bethlehem company gives the Government a guarantee of prompt delivery and superior results. Commodore Sicard and party returned to-day, and give a very favorable report of their trip and of the work that may be expected when the plant is fully completed.

ARMAMENT FOR THE CRUISERS.

The last of the three 10-inch guns for the new cruisers has been completed at the Washington Naval Arsenal. The tests will be made within the next month, preparatory to mounting the guns on the vessels. The tubes for these guns were furnished by the Whitworths, of England. No more guns of large caliber will be made, as the supply of metal by the Bethlehem Company, it is expected, will be ready by the time there will be a demand for it for the vessels now under way. The work on 6-inch calibers will continue as required, as the tubes for this class of ordnance have been furnished by home producers, like the Midvale Company. It is safe to say that no more foreign steel will be required by the United States Government for the manufacture of ordnance for the navy. The ordnance bureau has just finished the two 10-inch steel gun carriages which will be used for mounting the large guns.

THE STEM OF THE CRUISER BALTIMORE.

A telegram has been received from the Stanton Steel Company, at Thurlow, Pa., announcing the casting of the upper part of the stem and stem-post of cruiser No. 3, the Baltimore, the keel of which has been laid at Philadelphia. The test will be made immediately by Lieutenant Kaufman, the officer who has been ordered to that duty, and who will report forthwith, so that there may be no delay from that cause.

Commander Evans, Chief Steel Inspector, is now in Pittsburgh giving his personal attention to the tests of steel plate being rolled in that city. Lieutenant Milligan is engaged in collating the results of these tests in the office here. These tables will constitute a very valuable series for use in future metallurgical operations in the manufacture of material, both for the Government and for private uses. Their immediate value to the Government will be that they will give a connected history of the material which will enter into the building of all the ships now in course of construction for the new navy.

Special Notices.

BUSINESS OPPORTUNITIES.

To Manufacturers.

BELOIT,
WISCONSIN.

A beautiful city of 6000 inhabitants, located in the Rock River Valley, within three hours' ride to Chicago and Milwaukee, over competing railway lines, offers large inducements to manufacturers. Close proximity to hard and soft lumber, iron mines and furnaces; cheap coal; unsurpassed facilities for receiving and shipping by rail; lowest freight rates; no switch charges; superb water power; cheap homes; colleges, schools, churches, and all social advantages; intelligent and contented labor, male and female; best climate in the world to work in; gas and electric light; water-works sufficient for 50,000 population. For particulars address,

J. B. DOW, Sec'y,
BELOIT BUSINESS MEN'S ASSOCIATION,
Beloit, Wis.

FOR SALE, CHEAP—Small Manufacturing Site on Rock River, Beloit, Wis., frame building, 50 x 200 inches water, about 20 horse power, water wheel and jack. Price, \$3000. Address J. B. DOW, Beloit, Wisconsin.

IN ORDER to give exclusive attention to and extend its manufacturing facilities for which its present location does not give required room, a company long established and admirably located in a western city, at present engaged in Manufacturing and Jobbing Plumbers, Gas Fitters, and Steam Fitters' Supplies, will dispose of at favorable figures its leasehold and stock of goods and material held as dealers or jobbers of such goods, with all unfilled or accepted orders for same, existing at date of disposal. Provision for the later, if of such material as this company proposes to manufacture, can be made at prices and on terms satisfactory to the purchaser if so desired. A continuance of the business without interruption and disappointment to the trade being this company's wish. Purchasers can take immediate possession of a paying business, with a trade secured. Business established 22 years; size of building, 44 x 110 inside; five floors with light on three sides; every floor available for use; entire building warmed by steam; offices large, convenient and well lighted; large back yards on ground, second and third floors, and entire building lighted by electricity and gas. Such permanent fixtures as Rollers, Engine, Heating and Lighting Apparatus, Power Elevators, &c., or any part of same, will be included in sale if desired. Present trade chiefly in New York, Pennsylvania, Ohio, Indiana, Michigan and Canada, with large retail trade in the immediate vicinity. Satisfactory terms of payment with reliable purchasers, and information as to present business needed for its continuance, fully and freely given. Address, in person or by letter, WORKWICK MFG. CO., Cleveland, Ohio.

ST. PAUL AND NEWPORT IMPROVEMENT COMPANY.

CAPITAL \$2,000,000.

This Company offers a BONUS, Liberal Inducements and the Finest Location in the Northwest to any Manufacturing Concern that will remove their plant to St. Paul, Minn., or start a new manufactory.

Send for Circulars.
Correspondence Solicited. Address
FRED. S. BRYANT, Sec'y,
ST. PAUL, MINN.
(BANK OF MINNESOTA BUILDING.)

For Sale,

For best of reasons, a clean stock of Light and Shelf Hardware and Sporting Goods that will invoice about \$6000. The finest store front and fitted up room of the kind in a city with a population of 45,000 and is one of the largest manufacturing and railroad centers in State of Pennsylvania. Is and always has been doing a paying business and now enjoys the most lucrative trade in Builders' Hardware, Carpenters' Tools and Sporting Goods in the city. An exceptional opportunity for a young man. In the employ of the store is the best liked hardware clerk in the city, hard worker, competent to run the business, thoroughly honest, kind in manner, in best of repute with the contractors, and working for a moderate salary. Address

"REASON,"
Office of The Iron Age, 66 and 68 Duane St., N. Y.

For Sale.

Foundry, 100 x 40 ft. and Machine Shop 60 x 30 ft., both with water privilege; also Japan and Packing House 60 x 20. Store Storehouse 50 x 14 and Storehouse and Box Shop 30 x 20. All in good repair and running order; five minutes from steamboat and ten minutes from two railroad stations. Address

WILLIAM KEIGHLEY'S EST.,
Middle Haddam, Conn.

FOR SALE.

To Close an Estate.
A hardware stock of \$15,000 in the best business city in Michigan. Business established twenty-five years. Address "HARDWARE STOCK," Office of The Iron Age, 66 and 68 Duane St., New York

For Sale,

Hardware, Stove and Implement Business in the "Boom" City of the Eastern Indiana Natural Gas Territory. The city has a population of 5000 and will double its present population within two years. Business has been established over ten years, and is the largest retail hardware store in Eastern Indiana, and does a business of \$100,000 per year. Present owners desire to engage in a manufacturing business in reason for selling. This is a rare opportunity for a live man. Address "SALE," Office of The Iron Age, 66 and 68 Duane Street, N. Y.

Alabama's Mineral Belt.

Parties wishing information about, or investment in, Alabama Mineral, Lumber or Agricultural lands, will please address, with stamp, EDWARDS & ARNOLD, Talladega, Ala.

Special Notices.

BUSINESS OPPORTUNITIES.

FOR SALE,

The Melvin Sewing Machine Co.'s Factory and grounds, located in Chillicothe, Ross Co., Ohio, and adjoining the depot grounds of the C. W. & R. and Scioto Valley Railroads. The main building is of brick, 133 x 33 feet; three stories, slate roof, well lighted and floors 6 in. thick. The Engine, Boiler and Japan rooms and Blacksmith shop, are all of brick and covered with tin. The whole building heated by steam and lighted by electricity. It contains a 45 horse-power Reynolds-Corliss Engine, a 75 horse-power Babcock & Wilcox Boiler and Edison Dynamo, all in good condition. One house and lot and three vacant lots, all adjoining the factory grounds. This is a desirable property for manufacturing purposes, and will be sold at a bargain. For further particulars call on or address

NELSON PURDUM, Receiver,
Chillicothe, Ohio.

FORT SCOTT, KANSAS.

Attention of Capitalists and Manufacturers is called to the numerous advantages existing at Fort Scott, Kansas, which will soon make this city one of the most important manufacturing and commercial points in the West, and enable it to maintain its present supremacy over all other cities in this State. The natural facilities are unequalled. Coal of the best quality is sold at \$1.50 to \$2.00 per ton; slack, 50 cents to \$1 per ton. Abundance of stone and brick, best quality. Natural gas is fully developed and used for all purposes. Facilities for transportation and distribution are unequalled, being already the junction of two trunk railways. First communication with lumber regions of Missouri and Arkansas. Correspondence solicited.

SECRETARY BOARD OF TRADE.

BESSEMER STEEL COMPANY, Ltd.,

Office, 218 S. Fourth St.,
PHILADELPHIA, December 1, 1886.
A demand for steel blooming mills of small size having arisen, we have decided to grant licenses for movable feed tables having driven feed rollers under the George Fritz patent, No. 133,771, dated December 10th, 1872, hereinafter, with reference to the product of the mill.
Licenses will therefore be granted under the said patent for mills hereafter erected and put into use upon the payment of \$1000 down and a royalty of ten cents per ton for all metal rolled thereon in excess of 50,000 tons in any year.
These terms are extended only to mills hereafter erected by persons procuring licenses before said mill is put into use.
All infringers of this patent will be vigorously prosecuted.

JOHN M. KENNEDY, Secretary.

FOR SALE.

The Old Colony Iron Co., of Taunton, Massachusetts, offer for sale their Rolling Mill, Nail Factory, Machine Shop, Foundry, Copper Shop, Land and Tenements, situated in the town of Somerset, on the Taunton River, 4 miles above Fall River. Said Mill contains 7 Double Puddling Furnaces, 1 Scrap Furnace and 4 Heating Furnaces, with Squeezers, Rollers, and the necessary apparatus for converting the product of said furnaces into nail plates. The Nail Factory contains 8 Nail Machines, with a capacity of cutting all the plates the mill rolls.

The above property is situated on a wharf where vessels drawing 15 feet of water can discharge coal and iron directly to the mill. They also offer for sale their Tack Plate Rolling Mill, Shovel Shop, Water Privilege, Land and Tenements situated at East Taunton, Mass. For further particulars, address

O. A. WASHBURN, Jr., Treas.,
Providence, R. I.

For Sale or To Lease,

at Perth Amboy, New Jersey, adjoining wharves of the Lehigh Valley R. R. 130 feet of water, admitting largest ocean steamships without obstruction of any kind, 1200 feet dock front by 4000 feet in depth. This property is crossed by the Lehigh Valley Railroad, the Pennsylvania Railroad and the N. J. Central Railroad, and, besides being on one of the finest Harbors on the Coast, is also on the line of the Delaware and Raritan Canal Towing Line. Thirty feet of Water in front of property, and three Railroads, Lehigh Valley, N. J. Central and Pennsylvania, all crossing the tract. See map on page 41. Address

WILLIAM T. MEREDITH,
No. 48 Wall St., New York.

FOR SALE AT A BARGAIN.
The Plant and Stock of an Implement Manufacturing Company, located in Northern Iowa; established five years. Manufactures popular and well introduced; Machinery all new and of modern design. Substantial brick buildings; sufficient for large business; use unfailing water-power at minimum cost. Good railroad facilities. Thriving town and removed from labor strikes. Address "J. A.," Office of The Iron Age, 66 and 68 Duane Street, N. Y.

Business Opportunity.

Partner wanted with \$20,000 to double present capacity. Established manufacturing business; special and staple goods; first-class reputation; running night and day and business increasing. None but principals need correspond. References given and required.

"ALRAP,"
Office of The Iron Age, 66 and 68 Duane St., N. Y.

ATTENTION,
Capitalist and Foundryman.

An Incorporated Company offers for sale State Rights to manufacture, and sell a valuable Patent Boiler (for house-heating). Hundreds in successful operation, which can be referred to for full particulars.

Address Box 1006,
WORCESTER, MASS.

New England States reserved.

TO MANUFACTURERS SEEKING A LOCATION:

Look at Earlville, Ill.; two railroad lines to Chicago; direct communication with all Western and Northwestern points by Chicago, Burlington and Quincy, and Chicago and North-Western systems. Cheap coal; two short lines to coal fields; one to Streator, Ill., one to Springfield Valley and La Salle. Address H. W. SANDER, Cor. Secretary of Earlville Industrial Association, Earlville, Ill.

Special Notices.

BUSINESS OPPORTUNITIES.

MUNCIE, INDIANA,

is surely blessed by nature, and destined to become one of the great manufacturing cities of the West. It is already acknowledged by experts to be equal, if not superior, to Findlay, Ohio, as a natural gas-field. Its shipping facilities are unsurpassed for local and through rates East, West, North and South. It has all the modern improvements of the largest cities—Water and Gas Works, Edison Incandescent and Brush Electric lights. Its healthy and beautiful location makes it a desirable home. Warren, Jones & Gratz have removed their immense Bagging Factory from Brooklyn, N. Y., to Muncie, and several other manufacturers in Glass, Iron and Wood are negotiating with the Board of Trade and private citizens for the same purpose. Its inhabitants are energetic, and famous for their liberality and sociability, and will cordially welcome all industrious people who will join them in their progressive march. All information desired can be had by addressing

SECRETARY BOARD OF TRADE,
MUNCIE, IND.

TO MANUFACTURERS.

The Business Men's Association of the city of Fond du Lac, Wis., desire to enter into correspondence with firms, corporations, associations and business men generally, who are seeking new locations for already constructed plants or the location of new ones. Good building sites, cheap; railroad connections the best, having eight lines; water communication with Great Lakes by lake, Winnebago and Fox River.
All manufacturers treated most liberally by railroads; forty trains daily. The healthiest city in United States, as shown by government statistics. Holly system of water works supplied by artesian wells, giving best fire protection, and furnishing water unsurpassed in the world.
All kinds of timber in close proximity by rail and water. Fuel cheap; two railroads running directly to coal fields of Illinois. Good schools; good churches; good society; excellent public library. Living and labor cheap. No labor troubles in factories.

In short, the best and most healthful locality for manufacturing in the West.
Come and examine personally, or write to
C. H. BENTON, Ch'm Com. on Mfrs. a business Men's Association.

A PARTNERSHIP

In a first-class Retail Hardware Business, in a large manufacturing city, in New York State, is offered for sale. This is a very good opportunity for some one to connect himself with a well-established and prosperous concern. Capital required, \$12,000 to \$15,000. Full information will be given to responsible enquirers by addressing

"S. C. C.," BOX 107,
Office of The Iron Age, 66 and 68 Duane St., N. Y.

FOR SALE,

Over 5000 Acres of Land

underlaid with Coal, Iron Ore and Limestone; a Blast Furnace and 24 Coke Ovens; 3 or 4 miles of Railroad connects the property with the Cincinnati, Washington and Baltimore Railroad.

H. R. KNOTT, Agent,
Lewistown, Mifflin Co., Pa.

A rare chance to buy a moving stock of
HARDWARE, STOVES, PAINTS, &c.
Good location in a city of 240,000 inhabitants; satisfactory reason for selling.

"BUSINESS," Box 44,
Office of The Iron Age, 66 and 68 Duane St., N. Y.

FOR SALE—Stock of Iron, Steel, Wagon and Carriage material, both iron and wood; also, large, convenient Store Room, located in growing manufacturing and now booming city of Quincy, Ill., the second city in the state, population about 40,000; quite a railroad centre, and on the great Mississippi River, excellent traveling territory on every side; fine, rich country scarcely equalled. Business established twenty years. Heavy money every year. The only store of the kind in the city. Reason for retiring, bad health.

LEMLEY BROTHERS, Quincy, Illinois.

FOR RENT,
VALLEY ORGE MILL
AND WATER-POWER.

(Belonging to Estate of Charles H. Rogers, dec'd.) Situated at Valley Forge, Pa., on the Philadelphia and Reading Railroad, 22 miles from Philadelphia. The buildings consist of a four-story stone Mill, L shaped, with tin roof, 28 stone Tenant Houses and stone Dry and Dye House. The water-power is known as one of the best in the State. The property was occupied for many years as a Woolen and Cotton Manufacturing, but is adapted to general manufacturing purposes.

For particulars, address
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A MANUFACTURING PROPERTY IN DAVENPORT, IOWA.
This property consists of Foundry and Machine Shop, and is admirably located, so far as labor, material and transportation are concerned, for manufacturing purposes. Desirable parties having capital or established business will receive the encouragement of local Board of Trade and citizens' society, the "Advisory Club." This is an unusual opportunity for parties desiring to establish a business in the West, where every encouragement will be given, and it is especially adapted to any branch of machine or hardware manufacture. Address JAMES P. DONAHUE, Davenport, Iowa.

References: Henry R. Worthington, New York; Citizens' National Bank, Davenport, Iowa.

MANAGER for a well-equipped Machine Shop and Foundry, incorporated under the laws of the State of New York, who can invest ten or fifteen thousand dollars with services and influence trade; a splendid chance for the right man. Address

"CONFIDENTIAL,"
Office of The Iron Age, 66 and 68 Duane St., New York

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The Iron-Work of fifty Ore Cars. Standard gauge 30-inch wheels; 4 1/2 tread; 4-inch iron axles. All in good condition, and in lots to suit.

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preparation of Black Lead and other materials. It makes a hard skin or veneer on the mold, which does not rub off nor run before the molten metal.

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PLANS, SPECIFICATIONS and ESTIMATES

AND TO
SUPERINTEND THE CONSTRUCTION OF ROLLING MILLS AND MACHINERY, REGENERATIVE GAS FURNACES, TUBE AND PIPE MILLS, ETC., ETC.

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Industrial Publishers, Booksellers and Importers,
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Illinois River Improvement.

Irons for Lock-Gates, Valves, &c., at La Grange Lock, on the Illinois River.

U. S. ENGINEER OFFICE,
Room 25, Honore Building,
Chicago, Ill., April 20, 1887.

Sealed proposals, in duplicate, will be received at this office until 12 o'clock, noon, standard time, May 20, 1887, for furnishing and delivering the Iron and Steel necessary for the Lock gates and Filling Valves at La Grange Lock, Illinois River. Approximate amounts required:

Steel	43,000 lbs.
Wrought Iron	27,500 "
Cast Iron	110,000 "

For specifications, blanks for proposals and all information apply at this office.

THOS. H. HANDBURY,
Major, Corps of Engineers,
United States Army.

WANTED,

A FIRST-CLASS MAN to take charge of MACHINERY FOR MAKING HORSE SHOES. Permanent employment. Also one or two BOAT SPIKE MACHINES.

Second-hand Machines in good order will suit. Address,
P. O. Box 12, Richmond, Va.

WIRE and NAIL.

Manufacturers' Account or kindred lines for

CHICAGO and NORTHWEST

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Office of The Iron Age, 66 and 68 Duane Street, N. Y.

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PORTLAND, OREGON.

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No. 1 Wrought Scrap Iron; Wrought Iron Turnings; Steel Turnings; Cast-Iron Borings; Burnt Iron, &c.

JOS. J. LIPPINCOTT & CO.,
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AGENTS WANTED.

In every manufacturing town to sell

DuPlaine's Plumbago Babbitt Metal.

Very liberal discount allowed and every inducement given you to make sales. Remember these are the Best Anti-Friction Metals made.

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Ten (10) No. 2 Siemens' Regenerative Gas Lamps, with Factory Fixtures and Reflectors complete and in order; only used three or four months. Will be sold cheap.

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Successors to
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HARDWARE AUCTIONEERS,

19 Murray St. and 15 Park Place, N. Y.
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

Special Notices.

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Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

DRUGHTMAN—Address "ROLLING MILL," Office of The Iron Age, 66 and 68 Duane St., New York.

A MAN THOROUGHLY CONVERSANT with Buyers and Makers and all particulars of WIRE NAILS. Address with references, experience and salary expected, "BOX 3240," N. Y. P. O.

WANTED, SALESMAN

with headquarters at Richmond, Va. to look after PLATE STEEL TRADE

in that city and Southern points.

Address P. O. Box 2043, New York City.

WANTED BY A PHILADELPHIA HOUSE a first-class HARDWARE LE-MAN; also a young man of highest ability to travel. All communications confidential. Address "ELYOR," Office of The Iron Age, 66 and 68 Duane St., N. Y.

AS MANAGER, an active, brainy man, fully posted in car-wheel and general foundry work, with capacity to successfully operate a large establishment in the Southwest, and who can give the best of reference. Address "CAR WHEEL," Office of The Iron Age, 66 and 68 Duane St., New York.

ROLLING MILL MANAGER—An old, well established Rolling Mill Company wants to engage a first-class Manager to take charge of its mills. Must be thoroughly competent and experienced in rolling Merchant bar iron and steel, and all structural shapes. Address, with full particulars, "IRON AND STEEL," office of The Iron Age, 66 and 68 Duane St., N. Y.

WANTED, ROLLING MILL SUPERINTENDENT, to take charge of rolling mill in the South making mill plate and merchant bar; state experience, reference and wages expected. Address "BIBB," Box 101, Office of The Iron Age, 66 and 68 Duane Street, New York.

EDGE TOOL MAKER—Wanted, a first-class man. Steady employment and good wages. Address

L. & J. WHITE, Buffalo, N. Y.

WANTED—A man with capital to take charge of office and general business of a steel works already established. Said works are in active operation. For particulars, address "Steel," P. O. Box 314, Pittsburgh, Pa.

WANTED, SALESMEN to sell Pocket Knives and Scissors to the retail trade in the following cities and surrounding country: Cincinnati, St. Louis, Indianapolis, Cleveland, Buffalo, Richmond, Va.; Atlanta, Ga.; New Orleans, La.; Address, "Knives and Scissors," office of The Iron Age, 66 and 68 Duane Street, New York.

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Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

ON THE ROAD OR INSIDE by a gentleman thoroughly acquainted with the HARDWARE TRADE, wholesale or retail; acquainted with Missouri and Iowa trade; habits and ability; references first-class. For correspondence or interview address "C. MILLINGTON," 110 Concert Street, Keokuk, Iowa.

MANAGER OF WIRE NAIL WORKS. Open for an engagement. Draughtsman and Machinist who has had twenty years' experience in building and operating WIRE NAIL MACHINES. Address "THORN," P. O. Box 757 Pittsburgh, Pa.

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MECHANICAL ENGINEER and DRAUGHTSMAN, thoroughly competent, with a wide experience in draughting, estimating and constructing engine and boiler work, millwork and machinery, structural work, &c., and also in planning and building and prominent men as character and ability. Address "M. E. A. D.," Office of The Iron Age, 66 and 68 Duane St., New York.

EXPERIENCED MANAGER, thoroughly competent; at present engaged with a large rolling mill, Angles Channels, Bar Iron, &c., &c. desires a change of situation. Highest testimonials for ability and character. Satisfactory reasons for wanting to change. Address "A. M. K.," 723 Buttonwood St., Philadelphia, Pa.

A THOROUGH OFFICE MAN, 25, Book-keeper, Cashier, Correspondent, &c., &c. has a vast experience in the hardware and iron trade, over four in present connections, desires a position in similar capacity or as office manager with good wages; no objections to leaving city; unquestionable references and honor if required; is responsible for desiring to change. "E.," Office of The Iron Age, 66 and 68 Duane Street, New York.

ASST. SUPERINTENDENT by a young man whose education and experience in mechanical trades and in business matters makes him thoroughly competent to fill a responsible place; refers to leading manufacturers and prominent men as character and ability.

Address "ASST. SUPT.,"

P. O. Box 672, New York City.

THE UNDERSIGNED would like to represent several special articles or lines in Kansas City, Saint Joseph, Mo., Leavenworth, Kas., Atchison, Kas. and other near points, and pay own traveling expenses. Best of references. Address K. M. FAUST, Atchison, Kas.

A N A 1 PLATER in Nickel, Gold, Silver, Brass, Bronze, Copper, Tin, &c., desires a situation; competent as a Green-Eyed Finisher, or Buffer; can take charge or contract for any class of work; is practical and reliable; best of reference. Address, "A 1 PLATER," Office of The Iron Age, 66 and 68 Duane St., N. Y.

BY A MECHANICAL AND HYDRAULIC ENGINEER with twenty years' experience as business manager, of Iron Manufacturing, Railroad Supplies and Machinery; thorough knowledge of office business, management of men, and Western

Special Notices.

BOOKS.

Pencoyd (The) Iron Co.'s Pocket Book. Containing many valuable tables and calculations of interest to bridge engineers and users of iron beams in general, together with the standard shapes and dimensions of this Company. Third edition, with additions.....\$2.50

Handbook on the Teeth of Gears.
Their Curves, Properties and Practical
Construction, enlarged edition. By
G. B. GRANT.....\$

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Leveling; Barometric Trigonometric and Spirit. By I. O. BAKER...\$0.50

Analysis of Rotary Motion, as applied to the Gyroscope. By MAJOR J. G. BARNARD.....\$0.50

book for the use of students. By G. H. BLAGROVE..... \$0.60

French Measures and English

Equivalents; for the use of manufacturers in Iron and Steel, engineers, tool-makers, millwrights, draughtsmen, foremen, mechanics, forgemen, roller-men and artisans generally. By J. BROOK. \$0.40

A Practical Treatise on the Construction of the Power Loom and the Art of Weaving. Fourth edition, revised. By A. BROWN.....\$1 40

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NOTICE.

We buy and sell all classes of Iron and Steel

Scrap. Correspondence solicited,
JOS. C. POULTERER & CO.,
216 S. Fourth St., Philadelphia

**IRON AND
STEEL SCRAP.**

Address
VALENTINE & ARMSTRONG,
226 S. Fourth st., Philadelphia, Pa.

IMPORTANT.
Wanted Cast Wrought Iron and Steel Turnings.

Address, THOMPSON C. GILL & CO.,
Dealer in Iron and Steel of all kinds,
210 South 3d Street, Philadelphia, Pa.

GROOVED SKELP IRON

W. G. HOWELL,
17th and Clearfield Streets, Philadelphia.
Correspondence Solicited.

WE buy all kinds of Iron and Steel Scrap, Burnt Iron, Old Rails and Cast Boring (in carloads only). Write us, naming quantity and price.

ROBINSON & ORR,
115 Water St., Pittsburgh, Pa.
(ESTABLISHED 1859.)

WANTED,
Iron and Steel Scrap.

We buy all kinds of Iron and Steel Scrap
Write to us when you have any to sell,
SITES, WHEELER & CO.,

FOR SALE,
a Wright Automatic Engine, 18 x 42. Cylinder
and Locomotive Boiler, 21 x 6 feet.

FRANK McSWEGAN & SONS,
Bridge Store No. 1,
Cor. Duane St. and Franklin Square, New York

AUTOCOPYIST Only equaled by lithography. Specimens free.
AUTOCOPYIST CO., 156 William St., New York.

second floor, well lighted; rents \$180 to \$500. Ad-
ply on premises to
GEO. W. BRUCE, 9 Chambers St.

Trade Report.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]
LONDON, WEDNESDAY, May 11, 1887.

Scotch Pig.—The market has been unchanged, Scotch Warrants closing 41/2, as against 41 1/2 last week. Makers' brands are quoted as under:

Coltness, alongside, Glasgow.	44/6
Langloan.	45/6
Glenarnock.	47/6
Gartsherrie.	47/6
Shotts.	48/6
Dalmellington.	48/6
Carnbroe.	48/6
Eglinton.	48/6
Summerlee.	48/6
Carriage from Ardrossan to Glasgow is 1/9 ton.	

Bessemer Pig.—The market is unchanged. We quote W. C. Hematites, Nos. 1, 2 and 3, 43/4 @ 45/4 and 42/6 for later delivery.

Cleveland Pig.—The market has not changed, with closing quotations at 37/ for No. 1 Foundry; 36/ for No. 2; 34/4 @ 34/10 for No. 3, and 33/ for No. 4 Forge.

Bessemer Billets.—Bessemer Billets, 4 x 4 inches, are 77/ @ 77/6.

Bessemer Blooms.—The market is still irregular. We quote Blooms, 7 x 7 inches, 75/.

Bessemer Crop Ends.—We quote run of mill 50/ @ 52/.

Manufactured Iron.—The market is irregular. We quote:

Staff, Ord. Marked Bars.	6 10 0 @ 5 15 0
" Medium "	5 5 0 @ 5 15 0
" Common "	4 15 0 @ 5 5 0
Coops, 20 W. G. and over.	6 0 0 @ 6 10 0
" Common Best.	5 10 0 @ 6 10 0
" Medium "	5 10 0 @ 6 10 0
" Common "	5 0 0 @ 5 2 6
Sheets, 20 W. G. and under.	6 15 0 @ 7 5 0
" Ordinary Best.	6 0 0 @ 7 5 0
" Common "	6 0 0 @ 7 5 0

Welsh Bars are quoted £4. 5/ @ £4. 17/6.

Steel Rails.—The market is unchanged, with prices at £4 @ £4. 5/.

Old Rails.—The market is irregular, with closing quotations for Tees and Double-Heads, c.i.f. New York, 60/ @ 65/.

Scrap.—With an irregular market, quotations are at the close 55/ c.i.f. New York for Heavy Wrought Scrap.

Copper.—The market is unchanged, Chili Bars closing £39. 5/ @ £39. 10/, and Best Selected, £44. 10/ @ £44. 15/.

Tin.—The market is firmer, spot closing £104. 5/ @ £104. 15/ and futures £104. 15/ @ £105. 5/.

Tin Plates.—A good business has been done during the week, the demand being good. Prices are tending upward. We quote:

Tin Plates, 10x14, 1st qual. Charcoal.	17/ @ 18/
" 3d "	15/ @ 15/6
" 1st " Coke.	13/6 @ 14/
" 3d " "	13 @ 13/6

Spelter.—The market is unchanged. We quote £14. 2/6.

Lead.—We quote £12. 10/ @ £12. 12/6 for Common English Pig.

Freights.—Steam freights from Glasgow to New York are 7/6.

Financial.

Office of The Iron Age,
WEDNESDAY EVENING, May 11, 1887.

In trade and finance during the past week the general features are slightly higher rates for money, excited speculation in coffee, a tumble in the price of cereals, a heavy decrease in the surplus bank reserve and larger bank clearings, some increase in east-bound shipments from Chicago, a continued accumulation of coal at tidewater, uneasiness caused by labor strikes, actual or threatened, and many conflicting opinions respecting the operation of the Interstate law. As a whole the outlook favors a good spring business, though more active than profitable in most lines of enterprise. The full opening of navigation on the lakes and canals will be the signal for a heavy forward movement of freight, both East and West, large quantities of grain and general merchandise having been detained to take advantage of lower rates. The Welland Canal was opened May 4. An appeal from the New York Central, Lake Shore, Michigan Central and other roads, made to the Commissioners, represents that the enforcement of the long and short haul clause would work great injustice to them and their patrons. Up to this time 44 railroad companies have filed with the Interstate Commerce Commission formal petitions asking to be relieved from section 4 of the Interstate Commerce law, and a much larger number has been received from trade organizations, private corporations, and individuals protesting against the suspension of section 4 in particular cases. In the region of the lakes there is much rejoicing that the Commissioners refused to suspend section 4 as requested by the Northwestern roads. The Transcontinental Railway representatives concluded their conferences at Chicago without getting Canadian Pacific or Pacific Mail to agree on differential rates.

The Stock Exchange market was dull and uninteresting until Tuesday, though irregular. Bear operators were assisted by reports of trade disturbance caused by the Interstate law, while the other side were strengthened by improved railroad earnings. Coal stocks were affected by rumors of an impending miners' strike. Saturday's bank

statements afforded no stimulus. On Tuesday there was a better feeling, and in the late trade the tendency was upward except Reading. To-day the market was again stronger, but dull.

United States bonds are quoted as follows:

U. S. 3s.	100 @
U. S. 4s, 1891, coupon.	110 1/2 @ 110 1/2
U. S. 4s, 1897, coupon.	129 @ 129 1/4
U. S. Currency 6s, 1893.	125 3/4 @
U. S. Currency 6s, 1896.	128 1/2 @
U. S. Currency 6s, 1897.	131 1/4 @
U. S. Currency 6s, 1898.	133 1/4 @
U. S. Currency 6s, 1899.	135 1/4 @

General trade has been moderate, but in speculative circles enlivened by unusual excitement. Sales of coffee on Saturday reached the unprecedented total for a single day of 60,000 bags, at an advance of 3/4¢ @ 1/2¢. Wheat experienced a sharp decline, but is stronger; cash trading limited by extreme views of holders. Cotton quiet at the recent advance. Petroleum steady. Ocean freights quiet; grain charters few.

The weekly bank statement was a surprise in financial circles, showing a decrease of \$2,617,325 in surplus reserve, and an increase of \$4,808,400 in loans, with a corresponding increase of \$4,917,300 in deposits. The surplus reserve now stands at \$4,522,600, compared with \$11,113,525 one year ago. It is explained that a large amount of sterling bills have just been drawn by J. & W. Seligman & Co. and by Kidder, Peabody & Co. against blocks of railroad bonds placed abroad, and that hevy credits to the account of the latter house by some of the banks increased the "deposits" item, and caused the large apparent loss of surplus.

The bank clearings continue to look well, the total for 36 cities last week showing an increase over 1886 of 12.1 per cent. Outside of New York the aggregate gain was 26.8 per cent. Five cities reported decreases.

Of those showing increases Omaha figures for 106 and Boston for 31.3 per cent. In consequence of the dullness of the stock speculation, New York gained only 5.1 per cent. Commercial paper is in better demand. We quote 60 and 90 days' bills 5 per cent., longer dates 5 1/2 @ 8 1/2 per cent. According to the Custom House reports the exports of specie from this port during the week were \$526,761, making a total since January 1 of \$9,000,000, and the import were \$187,000; total since January 2, \$4,902,440. The Saturday Half-Holiday law takes effect May 25. Mr. Dyett, counsel for the New York Clearing House Committee, says:

"The law will operate on all bills of exchange, checks and promissory notes made after its passage and payable on any Monday celebrated as a public holiday, to make them presentable for payment or acceptance on the secular or business day next succeeding said Monday, in place of the preceding day at present legally designated. Some apprehension is felt as to its complicating the immense business daily transacted at the banks, including Saturday, when the heaviest dealings usually occur."

The imports of merchandise at this port during the week were larger, the valuation being \$9,111,483, making the total since January 1, \$165,532,893, as compared with \$154,165,000 for the corresponding period last year, and \$149,218,000 in 1885. The exports are \$200,000 below those of last week, the valuation being \$5,517,742, making a total of \$105,138,000 since January 1, against \$107,262,000 for the same time last year, and \$121,973,000 in 1885. The returns of foreign trade at this port for April show an increase of \$4,344,212 over the corresponding month last year, and the exports in decrease of nearly \$4,000,000—indicating a heavy balance of trade against the United States. For ten months, ending 30th ult., the imports at New York amount to \$373,500,000, exclusive of specie; increase, compared with last year, \$25,500,000; exports for same time, \$267,000,000; increase, \$7,832,000.

Charles S. Smith was elected president of the New York Chamber of Commerce to succeed James M. Brown, resigned, and Garret Roach and George E. Weed, iron shipbuilders, were elected to the membership. The Importers and Grocers' Exchange, of New York, have done little or no business for some time past, and will be placed in the hands of a receiver. John R. Foley is engaged in the formation of a savings bank, with a capital stock of \$500,000, to be located near Eighth avenue and 125th street. It is authoritatively stated that Mr. George J. Gould will become president of the Pacific Mail Steamship Company at the annual meeting on May 25.

Business failures for the week: Two bar-wire manufacturers in Illinois and the Merritt Fruit Company, of this city. The latter attribute their embarrassment to interruption of business by the recent strikes. Copeland & McLaren, pig iron importers of Montreal, are reported failed, with about \$235,000 liabilities.

The President-to-day appointed James W. Hyatt, of Connecticut, to be Treasurer of the United States, to succeed Conrad N. Jordan, resigned. Mr. Hyatt for 10 years was Bank Commissioner of Connecticut.

The new Western National Bank, offered by ex-Secretary Manning and ex-Treasurer Jordan, is now open for business.

Messrs. Gordon, Strobel & Laureau, of Philadelphia, who are building a 1380 foot furnace at Birmingham, Ala., for the Sloss Iron and Steel Company, successors to the Sloss Furnace Company and Coalburg Coal and Coke Company, closed a contract with them, on the 5th inst., for two others of the same size. At the same time the Sloss directors let contracts for 213 coke ovens.

NEW YORK.

American Pig.—No new features whatever have developed during the week, the market remaining very quiet and fairly steady. Inquiries are few and far between and call only for small lots, while there is no appreciable pressure to sell. A false impression may have been created through the offering during the week of a 500 ton lot of off-color bright Southern Iron, represented to be No. 1, at \$20. The Southern furnaces which reach this market are generally well sold up, some of them being far behind their deliveries. Of the Lehigh furnaces a few have no contracts beyond the end of June, but they are content for the present to await developments before making offerings for future delivery. We quote \$21 @ \$21.50 for No. 1 Foundry, \$19.50 @ \$20.50 for No. 2 Foundry, and \$18 @ \$18.50 for Gray Forge.

Scotch Pig.—The market is very dull, and occasional lots on dock are picked up at concessions. We quote for round lots, to arrive: Coltness, \$21.75 @ \$22.25; Glenarnock, \$20.25 @ \$20.75; Shotts, \$21.50; Gartsherrie, \$20.75 @ \$21; Carnbroe, \$21 @ \$21.50; Clyde, \$20 @ \$20.50; Summerlee, \$21.25 @ \$21.75; Dalmellington, \$20 @ \$20.50; and Eglinton, \$19.75 @ \$20.25.

Bessemer Pig.—There have been some inquiries for Foreign, but the scarcity of freight-room makes early deliveries difficult. As much as 14/ has been paid recently from Barrow. For delivery second half of 1887, Foreign has been offered at \$19.75, ex ship New York harbor.

Spiegeleisen.—The market is dull and weaker, with 20 Foreign nominally \$27 @ \$27.50. There has been considerable inquiry for small lots of Ferromanganese, which we quote, for 80%, \$60, which could be shaded under circumstances.

Bar Iron.—The market is very dull, and occasionally low offerings are heard, although the majority of sellers insist upon former quotations. We quote: Common, 1.85¢ @ 2¢; Medium, 2¢ @ 2.10¢, and Refined, 2.10¢ @ 2.50¢ on dock.

Structural Iron.—A number of round lots have been placed during the current week, and the market is steady. We quote Angles, 2.35¢ @ 2.40¢; Tees, 2.70¢ @ 2.90¢, and Channels and Beams, 3.3¢ base, on dock.

Plates.—Plates are still weak. We quote for round lots of Common or Tank, 2.35¢ @ 2.50¢; Refined, 2.50¢ @ 2.60¢; Shell, 2.7¢ @ 2.8¢; Flange, 3.7¢ @ 3.8¢; Extra Flange, 4.25¢ @ 4.50¢. For Steel Plates quotations are as follows: Tank, 2.75¢ @ 3¢; Ship, 3¢; Shell, 3.10¢ @ 3.25¢; Flange, 3.25¢ @ 3.65¢, and Fire-Box, 4.25¢ @ 4.50¢, on dock.

Steel Rails.—In the East only small lots have been sold during the current week, and some inquiries of the same character are coming up. In the West inquiries aggregating 40,000 to 50,000 tons have been received, although it is not quite sure that the largest single inquiry among them is not merely to arrive at some estimate of cost. We quote \$38 @ \$38.50 at Eastern mill.

Blooms and Billets.—Early during the week under review a resale of 6000 tons of Blooms was made, Western being changed to Eastern delivery. Foreign Blooms are nominally \$29 @ \$29.50. Foreign Billets are entirely crowded out of the Pittsburgh market by the selling on the part of the Wheeling mills.

Wire Rods.—The market is quiet, with some inquiry for early delivery, but no business for later shipments. We quote \$41 @ \$41.50.

Old Rails.—The market has been absolutely featureless, with the majority of holders unwilling to meet the prices occasionally made by those who are pressing lots on the market. The only transaction of any magnitude reported is a sale of 300 tons of Bridge Rails at \$21.50, delivered f.o.b. cars Jersey City, and the rumor of a sale of a similar lot at a shade under that price. Double Heads are offered here in part and for shipment at \$22 and Tees \$21.50.

Scrap.—No business of any consequence is reported. Yard Scrap may be quoted \$22 @ \$22.50 nominally, with some sellers asking \$23 @ \$23.50.

Rail Fastenings.—We quote Spikes 2.45¢ @ 2.50¢ here; Angle Fish Bars 2.15¢ @ 2.25¢. Steel Angle bars 2.25¢ and Bolts and Nuts 3.10¢ @ 3.20¢ and Bolts and Hexagon Nuts 3.25¢ @ 3.40¢.

Imports of Iron, Steel and Metals Into New York.

	To May 1, Last week.	Gross tons.	Last week.
Iron Ore.	7,375	256	
Pig Iron.	32,918	7,136	
Spiegeleisen.	28,547	2,493	
Old Rails.	65,629	3,384	
Scrap Iron.	9,790		
Scrap Steel.	7,308	40	
Blooms and Billets.	24,857	3,182	
Steel Plates.	126		
Wire Rods.	34,791	1,118	
Iron Bars.	3,528	47	
Steel Bars.	3,124	969	
Beams.	650	12	
Steel Plates.	2,185	18	
Pig Tin.	3,947	183	
Tin Plates, boxes.	512,392	76,313	

Philadelphia.

Office of The Iron Age, 230 South Fourth St.,
PHILADELPHIA, May 10, 1887.

Pig Iron.—There is not the slightest change to report, everything being in about the same condition as noted a week ago. Prices are neither higher nor lower, demand neither greater nor smaller, and prospects just as uncertain as they have been for a

good many weeks past. From the fact that things are no worse, some people are inclined to think that as the market has shown so much resistance, it may be on the eve of a recovery, as there is almost sure to be an active demand before long. Consumers have been taking deliveries on old contracts, which are in many cases beginning to run out, and while that affects producers as well as consumers it will probably have the effect of settling values, which for some time have been very irregular. On the whole, the chances appear to be in favor of a more active market, but without special change in prices, unless something unforeseen occurs in connection with the strike in the Coke regions and at other points. There is no greater urgency to sell than there was a few weeks ago (there are some anxious sellers, of course), but the limit in making concessions has been reached, as sellers appear to have named their bottom figures a week ago. Buyers have not taken hold very freely, however, and, in fact, show very little disposition in that direction, so that, as we said before, the position is practically unchanged. Small lots have been taken at \$20.50 @ \$21.50, at tide, for No. 1 Foundry, \$19.50 @ \$20 for No. 2, and \$18 @ \$18.50 for Gray Forge, with bid for the lower grade in lots of 1000 to 2000 tons each at about \$1.50 below the asking rates, which holders do not appear inclined to meet for the present at all events.

Foreign Iron.—There is some little inquiry for special brands of Bessemer, but we cannot quote sales, as prices are somewhat beyond buyers' ideas. Ordinary brands are available at \$20.50 @ \$20.75, c.i.f. duty paid, and 20¢ Spiegel, at \$27.50 @ \$28, but there is nothing doing.

Blooms.—The market is extremely dull, and prices entirely nominal, as no sales have been reported for some time past. There is some inquiry for quotations, but nothing likely to lead to business. We quote about as follows: Rail Blooms, \$29 bid for spot, and \$29.50 @ \$30 asked for shipments; Nail Slabs, \$30 @ \$31; Sheet-Iron Billets, \$34 @ \$36; higher qualities for Boiler Plate, &c., \$38 @ \$42. American Blooms as follows: Charcoal Blooms, \$54 @ \$55; Runout Anthracite, \$47 @ \$48; Scrap Blooms, \$38 @ \$39 1/2 "bloom" ton.

Muck Bars.—Prices are steady, and at \$32.50 @ \$33, at mill, a fair amount of business can be done, providing the deliveries are favorable to the buyer.

Bar Iron.—There is some little improvement in the demand, without anything like a large business offering. Orders for small lots have been numerous, and comprise the bulk of what has been taken, although there are some orders from car-builders for lots of from 300 to 500 tons each, but we cannot hear of any of them being definitely closed. Skelp orders appear to have ceased entirely, so that it is difficult to keep the mills at work on the amount of stuff called for by the smaller class of consumers. Taking it as a whole, the feeling is rather despondent, although in some quarters there are indications of renewed activity. Prices are unchanged, nominally, 2.2¢ for best Refined Bars, but 2.1¢ is nearer to the market, and as low as 2¢ for Grooved, and 2.35¢ for Sheared, but there is no inquiry at present.

Plate and Tank Iron.—There is no improvement in this department, and things are as dull as they have been for months. Some of the mills are, of course, tolerably busy, but there are others that are extremely anxious for work, to secure which very low prices would be quoted. There is nothing in the outlook to indicate any immediate improvement, so that prices are somewhat irregular, but usually quoted as follows: Ordinary Plate, 2.3¢ @ 2.35¢; Tank, 2.4¢; Shell, 2.6¢ @ 2.7¢; Flange, 3.65¢; Fire-Box, 4.2¢ @ 4.5¢; Steel Plates, Tank, 2.8¢ @ 3¢; Shell, 3.25¢; Flange, 3.5¢; Fire-Box 4¢ @ 4.5¢.

Structural Iron.—This department of the iron trade still maintains its activity, with prospects of an unusually promising character. The mills are all busy, and while no specially large contracts have been given out, there is enough coming in from week to week to prevent even temporary dullness, while the amount of business in sight imparts a feeling of great confidence in regard to the outcome of the summer business. Prices are steady at about the following quotations: 2.4¢ @ 2.5¢ for Bridge Plate; 2.30¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees, and 3.3¢ for Beams and Channels.

Sheet Iron.—Some departments are kept pretty busy, but the general demand is rather disappointing. There is a good deal of inquiry, however, and large orders could be taken if makers would name specially low quotations, but they prefer meeting the demand as it comes, at about the following rates:

Best Refined, Nos. 26, 27 and 28.	31 1/2¢
Best Refined, Nos. 18 to 25.	31 1/2¢
Common, 4¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28.	4¢ @ 4 1/2¢
Best Bloom Sheets, Nos. 22 to 25.	4 @ 4 1/2¢
Best Bloom Sheets, Nos. 16 to 21.	3 1/2 @ 3 3/4¢
Blue Annealed.	2.8 @ 3 ¢
Best Bloom, Galvanized, discount.	60 ¢
Common discount.	65 ¢

Steel Rails.—There is a good demand for Rails, and prices are very firmly maintained. Prospects are said to be favorable, and orders from several new roads are likely to be on the market during the summer months. Meanwhile all the work that can be turned out is called for on old contracts, so that the position is in all respects

favorable. The range of prices is \$39 @ \$40 at mill, the former quotation being an inside rate to the very best class of buyers.

Old Rails.—The market is as dull as ever. A few small lots have been taken at about \$22, f.o.b. cars, and one 500-ton lot at a shade less than \$22, but the majority are storing their Rails for \$23, or from that to \$24. The demand is very limited, however, and prospects at the moment not very encouraging.

Scrap Iron.—The demand is light, but small lots are taken at about the following quotations: Cargoes of No. 1 Scrap, \$20.50 @ \$21.50; small lots, tide water delivery, \$22.50; Selected do., \$24 @ \$24.50; No. 2 do., \$16 @ \$17; Turnings, \$15 @ \$16.50; Old Car-Wheels, \$17.50 @ \$18.50; Old Steel Rails, \$23 @ \$24; Cast Scrap, \$16 @ \$17; do. Borings, \$12 @ \$13; Old Fish Plates, \$25 bid, \$26 @ \$27 asked.

Wrought-Iron Pipe.—Demand is fair, and list prices are strictly adhered to. No change in discounts, which remain as last quoted—viz.: Lap-Welded Black, 50¢; Lap-Welded Galvanized, 32 1/2¢; Butt-Welded Black, 32 1/2¢; Butt-Welded Galvanized, 22 1/2¢; Boiler Tubes, 42 1/2¢.

Nails.—Have somewhat recovered, and the stoppage of many of the Eastern mills, during the month of May, will put the future on a better basis. In the meantime, \$2.35 from store is quoted with some degree of firmness, and it is doubtful if less than this would be accepted, unless the Nails were a poor, or comparatively unknown brand.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue,
PITTSBURGH, PA., May 10, 1887.

The condition of the general Iron and Steel industry has not improved during the week under review. There is a continued feeling of uncertainty, and business is dull in consequence. Values of all kinds of raw material are weak and drooping. Various causes are assigned for the reaction which has come so suddenly and unexpectedly, the most prominent of which is labor troubles, which within the past week or two have become quite common throughout the country. The great Coke strike still holds out, but the opinion appears to obtain that it will not be of long duration. It is estimated that the strike, directly as well as indirectly, throws out of work some 12,000 to 13,000 men, 10,000 of whom, it is estimated, have families. The action of the coke-workers in refusing to abide by the decision of the arbitration is severely criticised. The strikers say that their case was not properly presented to the umpire, but, if so, it was their own fault. One effect of the strike will be to stiffen Pig Iron if it holds out any length of time, as a good many furnaces in that event will be obliged to blow out, and thereby decrease production.

Pig Iron.—There has been no improvement in the situation during the past week. Within the past couple of weeks Mill Irons have gone off fully \$2, and Bessemer considerably more. It is well to bear in mind, however, that the latter was advanced considerably after the advance in Mill Irons had been checked. The indications are that the market will continue in its present dull condition until it can be determined whether or not the Coke strike has come to stay. It is difficult to give reliable quotations in the present unsettled and unsatisfactory condition of affairs, but we may quote as follows:

Gray Forge Neutral.	\$19.00 @ \$20.00, 4 mos
All Ore, Mill.	30.00 @ 30.50, 4 "
No. 1 Foundry.	21.50 @ 22.00, 4 "
No. 2 Foundry.	30.50 @ 31.00, 4 "
No. 3 Foundry.	19.00 @ 19.50, 4 "
No. 1 Charcoal Foundry.	35.00 @ 36.00, 4 "
Cold Blast Charcoal.	28.00 @ 30.00, 4 "
Bessemer Iron.	22.00 @ 22.50, 4 "

The lowest sale of Bessemer Iron reported was at \$21.79 cash, two weeks ago; it can now be bought considerably below that price but there is no demand for it. Some of the brokers think the offer of \$21 cash would be accepted. No. 1 Mill Irons are still quoted at \$19.50 cash, but \$19 cash would now be accepted. Consumers are all holding off, and while furnacemen generally are making little or no effort to sell, some are compelled to sell.

Muck Bar.—The market, in sympathy with Pig Iron, continues dull and unsettled, and prices have further declined. While thus far there have been no sales reported below \$32.50 cash, there is reason to believe that an offer of \$32 cash would not be refused. Some well-informed brokers incline to the belief that there will be an increased demand within the next few weeks, as there usually is with the advent of warm weather.

Manufactured Iron.—Orders have fallen off, and while the mills are pretty generally in operation some of them are not working up to their full capacity. Prices are weaker, in sympathy with the raw material, and it is evident that buyers are holding back, so that in the event of lower prices they will be in position to take advantage of the same. There is not much doubt, however, but what trade will pick up again as soon as the market becomes more settled, as requirements will be large from now until the last of the year. We continue to quote prices upon a basis of 2¢ for Bars, 60 days, 2¢ off for cash. There is not the demand for Skelp Iron that was expected, but it is probable it will improve as the season becomes more advanced.

Nails.—There is no improvement in the Nail market, which has been exceedingly dull all this year. Nearly all the factories have

CHARLES HIMROD & Co., dealers in Pig iron, Detroit, Mich., report, under date of May 9, 1887, as follows: Although the market still continues dull and very little call is made for Pig Iron, there have been more orders placed for Lake Superior Charcoal during the past week than for some time heretofore, at firm prices for good brands. Buyers are endeavoring, if possible, to secure iron for late fall delivery at present prices, which rather confirms the Iron maker in his idea that the Iron market will be stronger when the large general buying is done, is being accepted by the trade. Southern Irons at a very small figure here just now, the important factor in their consumption, the stove trade, being all shut down, owing to labor difficulties. It is generally thought that this "shut down" will last for a considerable length of time. We quote the market to-day as follows:

Lake Superior Charcoal, all numbers.....	\$3.50 @	\$4.50
Standard Superior Coke.....	21.00 @	22.00
Lake Superior Coke, Cinder Mixed.....	21.00 @	22.00
Standard Ohio Blackbands.....	33.50 @	34.50
Southern No. 2.....	21.00 @	22.00
Southern No. 3.....	21.00 @	22.00
Standard Iron, Lake Superior.....	22.50 @	23.50
American Old Iron Rails.....	24.00 @	25.00
Old Wheels.....	20.00 @	21.00

German, new list. dia 10 1/2 to 10
Cover, dia 50x2 1/2
Cover, dia 50x2 1/2
Cover, dia 50x2 1/2
Covered Spring, dia 90x10 to 10
Soldering Irons.
Cover's Adjustable list Jan. 1, 1880. dia 35x2 1/2
Spoke Shaves—Iron. dia 45 1/2
Wood dia 30 1/2
Halter, Stanley R. & L. Co. dia 40x10
Stearns dia 30x10
Spoke Trimmers
Bonney's \$ doz \$10.00, dia 50 1/2
Yeans' dia 20x10
Ives' No. 1, \$10.00; No. 2, \$12.00 dia 50x2 1/2
Douglases' \$ doz \$9.00, dia 20 1/2
Spoons and Forks.
Tinned Iron
Hasting, Central Stamping Co.'s list. dia 25x2 1/2 to 10
Solid Table and Tea, Central Stamping Company's
list. dia 25x2 1/2 to 10
Pittsford & Co. dia 35x2 1/2
Silver-Plated.
Meriden Brit. Co., Rogers dia 50x2 1/2
Seidman's dia 50x2 1/2
Rogers & Bro dia 50x2 1/2
Reed & Barton dia 50x2 1/2 to 50
Stimpson, Hall, Miller & Co. dia 50x10 1/2 to 50
Holmes, Booth & Hayden dia 50x10 1/2 to 50
H. & E. Silver Co., Mechanix Silver dia 50x2 1/2
Corman Silver dia 50 1/2
Nickel Silver dia 50x2 1/2 to 50
Britannia dia 50x10 to 50x10 1/2
Springs.
Elliott, Concord, Platform and Half Scroll dia 50x10 to 50x10 1/2
Chiff's Hoister Springs dia 25 1/2
Squares
Steel and Iron
Nickel-Plated dia 75 to 75 1/2
Twy Square and T. Hevels dia 50x10 to 50x10 1/2
Harris, Rogers, Day and T. Hevels dia 45 1/2
Wyerbottom's Try and Miter dia 30x10 1/2
Staples.
Fence Staples, Galvanized \$ lb. 4 1/2 to 4 1/2
Harris' Plain \$ lb. 3 1/2 to 3 1/2
Steelvards. dia 40x10 to 40x10 1/2
Sticks and Dies.
Blacksmith's, Waterford Goods. dia 40 to 40x2 1/2
Harris' Dies, Hartnolls' dia 45 1/2
"Lightning" Screw Plate dia 25 to 30 1/2
Stones.
Hindstons No. 1, 3 1/2; A&O, 3 1/2; Silps No. 1, 5 1/2
Washita Stone, Extra \$ lb. 17 1/2
Washita Stone, No. 1 \$ lb. 17 1/2
Washita Stone, No. 2, Extra \$ lb. 17 1/2
Washita Silps, No. 1 \$ lb. 37 1/2
Arkansas Stone, No. 1, 4 to 6 in \$ lb. 11 1/2
Arkansas Stone, No. 1, 6 to 10 in \$ lb. 11 1/2
Turkey Oil Stone \$ lb. 11 1/2
Turkey Silps \$ lb. \$1.00 to \$1.50
Tinsmith's Iron Tacks \$ pro \$5 to \$6
Lake Superior Silps, Chase \$ lb. 16 1/2
Seneca Stone, Red Paper Brand, P. B. \$ lb. 18 to 20 1/2
Seneca Stone, Blue Round \$ lb. 20 to 25 1/2
Seneca Stone, Small White, P. B. \$ lb. 25 to 30 1/2
Stone Polish.
Joseph Dixons' \$ pro \$5.00, dia 10 1/2
Gold Medal \$ pro \$4.50, dia 10 1/2
"Mirror" \$ pro \$4.50, dia 10 1/2
Rubb' \$ pro \$4.75, dia 10 1/2
Bluing Sun, 5 gro. lots \$ pro \$5.50
Hoyt's Soap \$ lb. \$6 net
Farlie's Marble & Ivory Enamel \$ pro \$13
Yates' Liquid \$ lb. 20 to 25
Water Standard Paste Polish, 10 lb cans, per lb. 15 \$
Jet Black \$ pro \$5.50
Firestone \$ pro \$5.50
Tacks, Brads, &c.
List, Sept. 1, 1882, and supplement, Jan. 1, 1880.
Steel Carpet Tacks dia 75 1/2
Swedes from Carpet Tacks dia 75 1/2
Swedes from Wire Carpet Tacks dia 70x2 1/2 to 70x10 1/2
Swedes from Upholsterers' Tacks dia 70 1/2
Tinned Swedes from Upholsterers' Tacks dia 70 1/2
Gimp and Lace Tacks dia 90x10 1/2 to 70 1/2
American from Cat Tacks dia 90x10 1/2 to 70 1/2
Copper Tacks dia 90 to 90x2 1/2
Copper Finishing and Trunk Nails dia 90 to 90x2 1/2
Plating Nails dia 90 to 90x10 1/2
Building and Ship Makers' Tacks dia 90x10 1/2
Trunk and Closet Nails dia 60x10 1/2
Basket Nails dia 60x10 1/2
Looking-Glass Tacks dia 50 1/2
Common and Patent Nails dia 50x10 1/2
Tinned Clipped Trunk Nails dia 50 1/2
Future-Frame Points dia 50 1/2
Lenthered Carpet Tacks dia 50 1/2
Shoe Finders' List Feb. 1, 1880, dia 10 1/2
Lining and Saddle Nails, List Jan. 1, 1880. dia 30x10 1/2 to 10
Jannard dia 30x10 1/2 to 10
Watkins Hardware Co.'s Steel Carpet Tacks \$ doz 12 1/2; tinned, 16 1/2
Circle Brand \$ doz 24 1/2; tinned, 32 1/2
Horse Shoe Brand uniform wts. 1 1/2; tinned, 16 1/2
Horse Shoe Brand, double unif. wts. 2 1/2; tinned, 32 1/2
Double-pointed Tacks dia 80x10 to 80x10 1/2
Wire Carpet Nails dia 60 to 60x10 1/2
Steel Wire Brads, R. & E. Mfg. Co. dia 50 to 50x10 1/2
Tap Borers.
Common and Ring dia 20x10 1/2
Ives' Tap Borers dia 35 to 45 1/2
Spring dia 20x10 1/2 to 30
Chesterman's Regular list dia 25 to 30 1/2
Thermometers.—Tin Case. dia 90 to 80x10 1/2
Thin, Bale.
Steel Wire, Standard list dia 50x10 1/2
Plumbers' Shears, &c. dia 20 to 25 1/2
Punches—See Punches
Snips, J. Mallinson & Co dia 35x2 1/2
Tileware
Stained and Glazed, list Jan. 20, 1887 dia 75 to 75 1/2 to 10
Tobacco Cutters.
Enterprise Mfg. Co. (Champion). dia 10x10 to 30 1/2
Wood Bottom \$ doz \$5.00 to \$5.25
All Iron \$ doz \$4.25
Nashua Lock Co.'s \$ doz \$18.00, dia 50 to 55 1/2
Wilson's dia 50 1/2
Chipper (Sargent & Co.) \$ doz \$24, dia 50x10 1/2 to 10
Acme \$ doz \$24, dia 50 1/2 to 40 1/2
Transom Editors.
Wollensak's Patent Iron Brazed dia 50 1/2
Gather's prouten from Rods list Jan. 1, 1887, dia 50 1/2
Gather's, Real House or Nickel Plate, list Jan. 1, 1887 dia 10 1/2
Exterior dia 10 1/2
Exterior dia 10 1/2
Payson's Universal dia 50 1/2
Crown and Star dia 10 1/2
Traps.
Game—
Newhouse dia 35 to 40 1/2
Columbia Patent dia 50x10 1/2 to 75 1/2
Game, Blake's Patent dia 40x10 1/2 to 50 1/2
Mouse and Rat.
Mouse, Wood, Choker \$ doz holes, 15 1/2
Mouse, Round Wire \$ doz \$1.50, dia 15 1/2
Mouse, Cage Wire \$ doz \$2.50, dia 15 1/2
Mouse, Cat, iron alive \$ doz \$2.50, dia 15 1/2
Mouse, Bonanza \$ gross \$15.00, dia 15 1/2
Mouse, Delusion \$ gross \$15.00, dia 15 1/2
Rat, "Honey" \$ gross \$15.00, dia 15 1/2
Cyclone \$ gross \$15
Trowels.
Lodges' Brick and Plastering dia 25 1/2
Reed's Brick and Plastering dia 15 1/2
Diston's Brick and Plastering dia 25 1/2
Pomeroy's dia 25 1/2
Clement & Maynard's dia 20 1/2
Rose's Brick dia 15 to 20 1/2
Seward's dia 15 to 20 1/2
Worral's Brick and Plastering dia 20 1/2
Garden dia 70 1/2
Trunks, Butter and Cheese.
Trunks, Warehouse, &c.
Penfield Black Co.'s list, 1882 dia 40 1/2
Twine.
No. 9, Flax Twine, 4 and 5 lb Balls 25 1/2 to 30 1/2
No. 10, Flax Twine, 4 and 5 lb Balls 25 1/2 to 30 1/2
No. 18, " " 4 and 5 lb " " 18 1/2 to 20 1/2
No. 24, " " 4 and 5 lb " " 18 1/2 to 20 1/2
No. 30, " " 4 and 5 lb " " 18 1/2 to 20 1/2
No. 201, Matras, 4 and 5 lb " " 18 1/2 to 20 1/2
Chalk Line, Cotton, 4 lb Balls 25 1/2
Cotton, 4 lb Balls 25 1/2
2 1/2 Ply Hemp,

Trade Report.

General Hardware.

There has been perhaps a slight increase in the volume of general business, and a good many assorted orders are coming in, making a fair aggregate, and indicating a satisfactory condition of trade. The large buyers are showing a disposition to dispose of their present supply before placing orders for future requirements, and manufacturers in some lines refer to the consequently moderate demand for goods. While the market is not characterized by as strong a tone as a short time ago, prices in most lines are maintained with regularity, but in others slight concessions are obtainable.

BARB WIRE.

The market is dull, and shows a weakening tendency. We quote Four-Point Galvanized Barb Wire $4\frac{1}{4}\phi$ @ $4\frac{1}{4}\phi$ in carload lots.

Dispatches to the daily press give the following account of the failure of Schnabel & Co., of Deering Station, Ill., and Sherman & Marsh, of Grand Crossing, Ill., for an aggregate of \$755,000:

The members of the former firm are Herman E. Schnabel and Eben J. Marsh as special partner, and of the latter firm Gen. Francis T. Sherman and Eben J. Marsh, his son-in-law. In both firms Noble P. Judah, a lawyer, was made assignee. Schnabel & Co. employed 50 men, and have been in existence about nine years, while Sherman & Marsh have been in business about seven years, employing 80 men.

The immediate cause of the failure was the maturity of \$10,000 worth of notes payable by Sherman & Marsh. The firm were disappointed in remittances, and therefore were unable to meet their obligation. As each firm were on the other's paper, the fall of one pulled down both. The works of both firms were running up to Saturday night, when they closed down on account of the scarcity of orders.

The schedules of assets and liabilities filed in the County Court make the following showing. In the failure of Sherman & Marsh the principal creditors are:

Washburn & Moen Mfg. Company	\$84,000
Commercial National Bank	30,000
American Wire Company	40,000
Merchants' Loan and Trust Company	30,000
H. P. Nail Company	26,000
Iowa Barb Wire Company	20,000
New Haven Wire Company	12,000
Stewart & Co.	27,000
John A. Roebbing's Son's Company	25,000
Cambria Iron Company	14,000
Schnabel & Co.	28,408

The Iowa Barb Wire Company are secured by 14 warehouse receipts issued by O. F. Gibbs & Son; the Commercial National Bank is secured by 30 warehouse receipts issued by O. F. Gibbs & Son, five by Hiram Sibley & Co., and nine by the Chicago Dock Company; the Merchants' Loan and Trust Company are secured by 20 warehouse receipts issued by the Chicago Dock Company and 14 issued by Hiram Sibley & Co. The open accounts are: Washburn & Moen Mfg. Company, \$11,416; Hartman Steel Company, Limited, \$3960; John A. Roebbing's Son & Co., \$13,515; Kubler & Beck, \$515. The total liabilities are \$448,880. The contingent liabilities of Mr. Marsh show that he is indorser on Schnabel & Co.'s paper for \$41,764, and is indorser of notes of Schnabel & Co. in favor of the Oliver & Roberts Wire Company, and guarantor on the contract of the Cambria Iron Company, amounting to \$47,280. The assets are \$250,070. E. J. Marsh's personal assets are \$15,726 and F. T. Sherman's personal assets \$17,393, making the total assets \$289,189, and liabilities over assets of \$159,691.

The list of firm assets show that they are the owners of real estate at Grand Crossing worth \$8000, real estate in Iowa, \$7303; merchandise on hand, \$103,562; office fixtures, \$559; open accounts, \$40,122; notes, \$700; cash in bank, \$576; cash in office, \$60.

In the Schnabel & Co. failure the principal creditors are Sherman & Marsh (\$41,764) and the American Wire Company, the Oliver & Roberts Wire Company, the Hartman Steel Company, the Cambria Iron Company, J. Wool Griswold, the Merchants' National Bank, the Commercial National Bank, the New Haven Wire Company, and Stewart & Company. The amount due the Merchants' National Bank is \$40,000, secured by 45 warehouse receipts issued by the Chicago Dock Company; the amount due the Commercial National Bank is \$15,000, secured by 16 warehouse receipts issued by Hiram Sibley & Company, and three by the Chicago Dock Company. The open accounts are: The New Haven Wire Company, \$1254; the John A. Roebbing's Son's Company, \$28,866; Sherman & Marsh, \$12,908—making the total liabilities over assets, \$120,009.

NAILS.

The market has been quiet, without any heavy sales. The bulk of the Nails pressing for resale by second hands is now more strongly held, but there have still been some low offerings by representatives of smaller mills, and by brokers. The leading representatives of larger concerns decline to meet these exceptional figures, and the market is generally considered to be in a position where a stronger tone may quickly develop. Standard Nails are quoted \$2.15 @ \$2.25 from store, with but little abatement from the lower figure for round lots.

Messrs. Morris, Wheeler & Co. have removed to a more commodious warehouse at 28 Reade street, where they will carry in stock full lines of Iron and Steel Cut Nails and Spikes, Galvanized and Tinned Nails, Chisel Pointed Nails and Wire Nails.

Our Pittsburgh correspondent sends us the following dispatch: "The regular monthly meeting of the Western Nail Association was held at Pittsburgh, Pa., to-day. There

was a very fair attendance. The present card rate of \$2.25, less 10 cents per keg in carload lots, and 2 per cent. off for cash, was reaffirmed. The next meeting of the association will be held in Wheeling, on June 8."

MISCELLANEOUS PRICES.

In consequence of recent advances in Iron, John Chatillon & Sons, 89, 91 and 93 Cliff street, New York, announce that they are compelled to advance their prices on Scale Beams. Their discount hereafter on No. 1 Scale Beams will be 40 per cent., and on No. 2 Scale Beams, 50 per cent.

The following are the list prices of the Galvanized-Iron Sprinkling Pot manufactured by Whiting & Co., 468 and 470 Cherry street, New York, and described among the articles on page 27. The list as given is subject to a discount of 50 per cent. to the retail trade:

6 quart	Per doz.
8 quart	\$12.00
10 quart	15.00
12 quart	18.00
16 quart	24.00

There are not many indications of any material additions to the line of Apple Parers which will be put on the market the present season. The Goodell Company, Antrim, N. H., are, however, preparing a new family Apple Parer, which will be called the Pomona. It is described as a small machine, and will sell to the retail trade for from \$4 to \$5. It is expected that it will be ready for this season's trade, but samples or circulars are not yet issued.

The price of the cheaper Wrench made by the Ellrich Hardware Mfg. Company, Plantville, Conn., for whom the Alford & Berke Company are special agents, 77 Chambers street, New York, is \$15 per gross, subject to a discount of 20 per cent. instead of 25 per cent., as recently announced.

The Malloy-Wheeler Company, New Haven, Conn., and 64 Reade street, New York, issue a circular, under date May 4, in which Padlocks and Padlock Keys are quoted at discount 66 $\frac{2}{3}$ and 10 per cent. It is also stated that to parties purchasing 50 dozen Padlocks at one time, a quantity discount of 5 per cent. will be allowed and continued on their further purchases for any quantity during the season ending December 31, 1887. The discount on all goods in their list except Padlocks and Padlock Keys is mentioned as 50 and 10 per cent.

Woodrough & McParlin, Cincinnati, Ohio, issue a circular describing some comparatively recent additions to their line, including Hand, Panel and Rip Saws, No. 60, 50 and 40, Hollow Back; also Buck Saws, No. 350, and Beef Splitters. On cards they also illustrate their Steel Back Cincinnati Butcher Saws, No. 7, the Leader Hand Saw, No. 100, and the Cincinnati Plastering Trowel. Their discount sheet applying to their list September, 1884, is as follows:

	Discount.	Per cent.
No. 10, Japanned, 10 inch, Planed Jaws	\$15.00	
No. 38, Japanned, 10 inch, Planed Jaws	18.00	

The market presents no specially new features, but is generally regarded as in a slightly better condition than when the break in prices first occurred. Several of the leading manufacturers have reached an agreement fixing a limit beyond which they will not sell the goods.

The manufacturers of Augers and Bits have recently been conferring at New Haven with reference to the irregular prices which have for some time prevailed. It is understood that the conference was one of manufacturers alone, in which their agents were not represented, and one of the objects desired to be secured is said to have been the reaching of some determination by which the market may be protected from irregular prices made by agents. There will be in this city to-morrow a meeting of the association, in which action may be taken in the matter. The feeling of the manufacturers was in favor of slightly higher prices, and it is hoped that it may be feasible to establish them. With the feeling that exists in certain quarters, it is not improbable that lower prices will prevail unless the irregularities that have heretofore existed are corrected.

The market for Steel and Iron Squares has been gradually strengthening, owing to the somewhat higher prices quoted by the manufacturers, and an increased disposition on the part of jobbers to hold their stocks more firmly. The quotations of the manufacturers are 75 per cent. discount in small lots or 75 and 10 per cent. discount in case lots, the latter figure being, however, freely given by leading jobbers without regard to quantity.

Hobart B. Ives & Co., New Haven, Conn., issue a circular relating to their line of Door Bolts, of which the different patterns are illustrated. The fact that they manufacture these goods in over 40 styles of finish is alluded to. They also issue a price list in similar form of Ives' Patent Sash Locks, with illustrations and list prices. They allude to the special features of these Locks as being that they are securely locked when closed, the meeting rails being simultaneously drawn together. These movements, it will be remembered, are accomplished by cams without the instrumentality of springs, thus avoiding the liability of getting out of order. The goods are made under patents dated April 17, 1883, October 16, 1883, December 30, 1884, March 24, 1885, May 12, 1885, June 23, 1885. The goods were patented in Canada, March 24, 1886. A new pattern has recently been added which is designated as Bell Tip Plain. The list on these goods is as follows, subject to a discount of 55 per cent.

	Per Dozen.
No. 431, Plain Iron, Bronzed	\$1.40
No. 432, Plain Iron, Coppered, Gold laquered	1.75
No. 433, Plain Iron, Bronzed, with Bronze Metal Knob, No. 1 finish	2.50
No. 434, Plain Real Bronze Metal, polished, No. 1 finish	7.50
No. 435, Plain Real Brass Metal, polished, No. 1 finish	7.50
No. 436, Plain Real Bronze Metal, polished, No. 2 finish	7.50
No. 437, Plain Real Bronze Metal, nickel plated	9.00

The Cincinnati Corrugating Company, Cincinnati, Ohio, manufacturers of Roofing, Siding, Ceiling Arches, Lathing, &c., issue the following price list. The prices given are per square, or a 100 square feet of Iron, measured according to the rules adopted by the National Iron Roofing Association:

Roll and Cap Roofing, painted red	\$4.00
Packed Standing-Seam Roofing, plain	4.00
painted red	
Packed Standing-Seam Roofing, corrugated, painted red	4.25
V-Crimped Roofing, painted red	3.75
Beaded Ceiling and Siding	3.75
When of Galvanized iron, \$2.50 per square extra.	

Corrugated Iron for Roofing, Siding, &c., 24-Inch Wide Corrugations. Corrugated Lengthwise.

Gauge.	Standard Roofing Gauge.	No. 26	No. 24	No. 22	No. 20	No. 18
Painted red	\$3.75	\$4.00	\$4.75	\$5.75	\$6.75	\$9.00
Galvanized	6.75	6.75	7.00	8.50	10.50	14.00

For Cross Corrugated Iron add 5 per cent. per square to above list prices.

For painting any other color than our usual red add 25 cents per square to above list prices.

To find price for 14 $\frac{1}{2}$ and 5 $\frac{1}{2}$ -inch wide Corrugations for Ceilings, Siding, &c., add 5 per cent. to list prices.

Prices above are for regular lengths and widths.

Nails and extra paint, dry, are 10 cents per square extra on painted; Nails for Galvanized Iron, 15 cents.

Round Ridge Cap, Fig. 4, per lineal foot, 12 cents, painted; 30 cents; galvanized; sold in 6-foot lengths.

Angle Ridge Cap, Fig. 14, per lineal foot, 10 cents, painted; 18 cents, galvanized; sold in 6-foot lengths.

Hip Cap, 4 cents per foot less than Ridge Cap, as per above.

Wooden Ridge Joint, Fig. 5 (order twice the length of your Ridge), 4 cents per lineal foot (for 24-inch Corrugation only).

Curving Sheets, Fig. 6, per square, 50 cents.

Cutting Gables or Angles, Fig. 22, per square, 50 cents.

Metallic Lath, Fig. 26, 14 inches by 3/4 inch Corrugations, per square foot, 3/4 cents, perforated, of regular lengths.

Metallic Cement, in barrel lots, 44 cents; in less than barrel lots, 3/4 cents per pound.

The price of the cheaper Wrench made by the Ellrich Hardware Mfg. Company, Plantville, Conn., for whom the Alford & Berke Company are special agents, 77 Chambers street, New York, is \$15 per gross, subject to a discount of 20 per cent. instead of 25 per cent., as recently announced.

The Malloy-Wheeler Company, New Haven, Conn., and 64 Reade street, New York, issue a circular, under date May 4, in which Padlocks and Padlock Keys are quoted at discount 66 $\frac{2}{3}$ and 10 per cent. It is also stated that to parties purchasing 50 dozen Padlocks at one time, a quantity discount of 5 per cent. will be allowed and continued on their further purchases for any quantity during the season ending December 31, 1887. The discount on all goods in their list except Padlocks and Padlock Keys is mentioned as 50 and 10 per cent.

Woodrough & McParlin, Cincinnati, Ohio,

issue a circular describing some comparatively recent additions to their line, including Hand, Panel and Rip Saws, No. 60, 50 and 40, Hollow Back; also Buck Saws, No. 350, and Beef Splitters. On cards they also illustrate their Steel Back Cincinnati Butcher Saws, No. 7, the Leader Hand Saw, No. 100, and the Cincinnati Plastering Trowel. Their discount sheet applying to their list September, 1884, is as follows:

	Discount.	Per cent.
Circular Saws to 46 in.	50	
Circular Saws over 46 in.	55	
Shingle Saws	55	
Veneer Saws	15	
Concave Saws	50	
Grooving Saws	25	
Edger Saws	50	
Repairs	40	
Mandrels	30	
Upsets	30	
Gauges	30	
Saw Sets	40	
Saw Sets	35	
Mixer Cutters	30	
Mixer Cutters	10	
St. me's Gummers and Cutters	40	
Emery Wheels	35	
Dole's Patent Wheels	10	
Planing Knives	10	
Planing Knives and Molding Cutters	10	
Band Saws	25	
Inclusive	45	
Hand Ice Saws	55	
Regular Cross-cut Saws (except Diamond and One-man Cross-cut Saws)	40	
Diamond Cross-cut Saws	50	
One-man Cross-cut Saws	40	
Hand Saws	35	
Hack Saws	25	
Compass and Pad Saws	25	
Pruning and Back Saws	35	
Brick and Plastering Trowels	25	
Blind Work	25	
Saw Bucks	10	
Saw Rods and Frames	25	
Inclusive	25	
Saw and Knot Cutters	25	
Cane Knives	25	
Bevels and Try Squares	65	
Miter Squares	25	

We are advised, owing to recent improvements in the Screw Case made by J. H. Smith, Delaware, Ohio, of which a description was given in our last issue, that its price has been advanced to \$10, crated, f.o.b.

There are some irregularities in the figures at which Standard Wire Nails are sold, and prices are frequently made considerably below the card rate.

The Phosphor-Bronze Smelting Company, 512 Arch street, Philadelphia, announce that their new foundry is now in successful operation, and fully equipped for the production of all kinds of phosphor-bronze castings, in green and dry sand or loam. The company make a specialty of car and locomotive bearings, heavy gearing, hydraulic marine, rolling mill, mining and engine castings. For ordinary machine castings they quote net cash prices as follows, castings delivered f. o. b., Philadelphia:

Quality.	Application.	Price per lb.
A. Very Tough.		20¢
B. For general Machine Casting; Pinions, Cog Wheels, Propeller Screws, Hydraulic Press and Pump Barrels, Piston Rods, Screw Bolts for Steam Cylinders and Hardware—Very tough and hard, and specially recommended to resist crystallization and corrosion.		26¢
E. For Bearings of Heated Rolls, Valves, &c.—Very hard.		27¢
F. For Bolts, Steam Whistles, &c.—Harder and stronger than ordinary Bell Metal.		27¢
G. For Rods and Bolts—Subjected to rapid or jarring motion.		36¢
S. Being Metal for all bearings of locomotive, Marine and Stationary Engines, Passenger, Freight and Street Cars, Rail Neck Bearings, Thrust Rings, Slide Valves, Crosshead Gibs, Piston Rings, &c.—Very hard and durable, and not liable to heat or cut the journal.		25¢

The price of the Hurd Patent Respirator, manufactured by the Morley Respirator Company, East Saginaw, Mich., and described on page 27, is \$24 per dozen, subject to a discount of 10 per cent.

The Chicago Hardware jobbers report their trade in danger of serious curtailment in consequence of the new freight rates adopted by the railroad companies under the provisions of the Interstate Commerce act. This applies not only to trade with the far West, which might naturally be regarded as contingent business, but also to trade with nearer localities, such as Mississippi River points and those sections in the Northwest which can be reached by lake, or lake and rail, from the East. Goods can now be shipped from Buffalo to Duluth, and thence by the St. Paul and Duluth Railroad to St. Paul and Minneapolis at rates equal to those charged by the railroads running from Chicago to St. Paul, thus reducing the cost by the lake route almost the entire rate from New York to Chicago. The competition on Mississippi River business is in favor of St. Louis jobbers. The diversion of business has already been felt by Chicago jobbers, and they have appealed to the Interstate Commissioners for relief. If trade is permitted to settle in the new channels now being marked out, the probabilities are against its recovery by Chicago unless railroad rates should again be reduced to former figures and kept down permanently. At present the situation strongly favors the establishment of a large jobbing trade at St. Paul and Minneapolis through the railroad interpretation of the Interstate Commerce act.

The following circular in regard to freights has been issued, under date May 3, and will be of some general interest, as showing the method adopted by the manufacturers:

With a view of equalizing the matter of freight delivery, it has been determined that on and after this date the lowest freight rate obtainable by purchasers from any one of the manufacturers whose names are hereto attached, shall be regarded as the basis of freight to be paid by purchasers, and any freight above such sum will be allowed by any of the undersigned manufacturers.

P. HAYDEN SADDLERY HARDWARE COMPANY, Columbus, Ohio.

NORTH & JUDD MFG. COMPANY, New Britain, Conn.

O. B. NORTH & CO., New Haven, Conn.

FRAZER & JONES COMPANY, Syracuse, N. Y.

H. W. MINNEMEYER & CO., Pittsburgh.

P. WILSON'S SONS & COMPANY, Cincinnati, Ohio.

ELBEL & CO., Canton, Ohio.

THOMAS DEVLIN & CO., Philadelphia, Pa.

PRATT & LETCHWORTH, Buffalo, N. Y.

The Penn Hardware Company, Reading, Pa., are putting in a new plant for electroplating both brass and bronze, and are intending to make a specialty of such work.

Their line of Builders' Hardware has recently been much enlarged and they are now offering an extensive assortment. Sise, Gibson & Co., 100 Chambers street, New York, are their agents, and carry a full stock.

The Secretary of the Treasury has decided that on the exportation of Sad Irons of the size designated by No. 3 1/2, weighing not less than 63 pounds to the dozen, which are manufactured wholly from imported Iron, a drawback will be allowed at the rate of 25 cents per dozen, less the legal retention of 10 per cent.

The Southwark Scale Company, Philadelphia, in our last issue, advertised a special offer on a lot of Fancy Painted Counter Scales. Through some misunderstanding the electro of their I X L Combination Counter Scale appeared in the advertisement, and they advise us that they will fully explain the conditions of their offer to the trade in our next issue.

The New York office of Miller Bros. Cutlery Company, Meriden, Conn., has been removed from 62 Reade street to 79 Chambers street.

The Goodell Company, Antrim, N. H., have issued their catalogue for the present year. Their line of Apple, Peach and other Parers occupies the greater portion of the pamphlet. Their White Mountain Hammock Chair and Stand are also illustrated. In addition to the foregoing, descriptions are given of Pierce's Improved Cahoon Broadcast Hand Seed Sower, the Granger, and Philadelphia Broadcast Hand Seed Sowers, and the Keystone Green Corn Cutter.

Announcement is made, under date of April 30, that the partnership heretofore existing between Chas. H. Amidon and Ansley D. White, of Buffalo, N. Y., under the firm name of Amidon & White, was dissolved by mutual consent, on the 21st day of April, 1887, and that Walter S. Bastedo having purchased of Ansley D. White his interest in the business and property of the late firm, the business will hereafter be continued at the former location, No. 135 Main street, by Charles H. Amidon and Walter S. Bastedo, under the firm name of Amidon & Bastedo. The affairs of the late firm will be settled by Amidon & Bastedo, who alone are authorized to sign the firm name of Amidon & White in liquidation.

The following changes have been made in the management of the Union Hardware Company, Torrington, Conn.: Duncan K. Major, for the past three years treasurer and general manager, has resigned, and will be succeeded by C. F. Fornald, late of Chicago, as manager, and M. B. Dunbar as treasurer.

H. M. Gay, who is widely known, having been on the road selling Hardware for the last 20 years, the last 12 of which as representative of the Biddle Hardware Company, Philadelphia, his field being especially Wisconsin, Illinois, Iowa and Minnesota, has gone into business in Milwaukee in partnership with his brother, George S. Gay. The firm name is H. M. Gay & Brother, and their business designated as wholesale Hardware specialties. They advise us that they have put in a stock including the leading lines of Shelf Hardware, Cutlery, &c. H. M. Gay, in connection with this new departure, will continue to represent the Biddle Hardware Company, and will travel over his old route as heretofore. He will also represent a few manufacturing concerns, including C. E. Jennings & Co., executing small orders from their Milwaukee stock, and shipping in larger lots direct from factory.

E. C. Stearns & Co., Syracuse, N. Y., issue a sheet for insertion in their catalogue, which gives illustrations of some of the recent additions to their line. It includes Tackle or Awning Pulleys, Side Pulleys, Increased Pulleys Clothes Line and Screw Pulleys and Stearns Silent Saw Vises.

L. W. Ferdinand & Co., Boston, Mass., to whose line of Heavy and Ship Chandlery Hardware and their catalogue relating thereto we referred in our last issue, are agents also for the Shelton Brass Hardware Company. In addition to the lines above referred to, the catalogue covers Brass and Nickel Plated Refrigerator and Ice House Hinges, Wire Rope, Chains, Canoe Fittings and other specialties.

Henry Schade, 56 and 58 Ainslie street, Brooklyn, E. D., N. Y., in a circular, May 2, 1887, states that, having found it desirable to give up his New York salesroom, he will in future devote his whole attention to the factory. He alludes to having had over 25 years' experience in this line, and expresses hopes that his assuming charge of the manufacturing department will be shown in the increased beauty of his ware and the promptness and dispatch with which orders will be filled.

The Fred J. Myers Mfg. Company, Covington, Ky., issue an attractive series of colored lithographs, which are used to call attention to the Hunter Sifter, of which they are manufacturers.

At a late meeting of the directors of the Barnes Mfg. Company, New Haven, Conn., Horace F. Sise was elected secretary and treasurer in place of the late John H. Barnes. The operations of the company will continue as before, their New York office being with Sise, Gibson & Co., 100 Chambers street.

The Collector of Customs at New York has written a letter to the Treasury Department in regard to various cases of imported merchandise wherein the department refused to permit entry on second invoices exhibiting a less value than the invoices first received. The Collector says that in cases where there are two invoices giving different values for the same importation, the entry, as a rule, must be made by a higher one, and that the establishment of a precedent for any other rule would lead to practices dangerous to the revenue. Assistant Secretary Maynard has notified him that his conclusions are approved by the department.

The Newhall Ship Chandlery Company, Henry B. Newhall Company, general agents, 105 Chambers street, New York, issue a neat and compact price list of the line of Hardware and Ship Chandlery Hardware which they are putting on the market. It also contains a list of the manufacturers for whom the Henry B. Newhall Company are general agents, among whom are many concerns of recognized prominence.

The George D. Winchell Mfg. Company, Cincinnati, Ohio, have recently issued a new catalogue of their goods, which are attractively represented with good illustrations on excellent paper. It covers their well-known line of Imperial Water Coolers, Japanned Ware, Coal Vases and Hods, Grocers' Supplies and Oil Tanks, Plain and Pieced Tinware, Deep Stamped Ware, Spoons, Common and Shallow Stamped Ware and miscellaneous goods. The trademark which the company have adopted is prominently represented.

The Gilbert & Bennett Mfg. Company, 228 Lake and 18 and 20 Franklin streets, Chicago, Ill., have recently issued catalogue No. 100, in which they illustrate and describe their extensive line of Wire goods. It is divided into several departments, of which department No. 1 relates to Galvanized Netting, Fencing, Gates and Tools, department No. 2 to Wire Cloth, department No. 3 to Wire Goods, including a large variety of specialties, department No. 4 being devoted to Foundry and Coalyard Supplies. Screen Windows and Doors, Corners, Frames, &c., are also represented. In their introductory address to the trade the company allude to the special features of their goods, with a special reference to the finish or covering used to protect the Iron or Steel from atmospheric influences, referring in this connection to their Pure Zinc Finish.

Robert T. Ladd, who is known to the trade for several years as traveler for some manufacturers, has opened a house at 46 Beekman street, New York, where, as Hardware manufacturers' agent, he is representing some well-known houses. We are

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The Socie & Cockerill, of Seraing, Belgium, have sent us a specimen of the new 105-pound rail section designed by Mr. C. P. Sandberg, of 19 Great George street, Westminster, London. It is being made for the Belgium steel railways, and is also making its way in other countries.

WHOLESALE METAL PRICES, MAY 11, 1887.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢; provided that no bar iron shall pay a less rate of duty than 35¢. Sheet, 1-10¢ to 15-10¢. Band, Hoop and Scrolled, 1¢ to 1 1/4-10¢. Railroad Bars weighing more than 36 lb per yard, 7-10¢ to 1¢.

Standard American Pig Iron.

Foundry No. 1, X..... 21.50
Foundry No. 2, X..... 20.00
Gray Forge..... 18.50

No. 1 Scotch Pig Iron.

Cambridge..... 22.50
Cottrell..... 22.50
Shotts..... 22.50
Glenbrook..... 22.50
Gartell..... 22.50
Langdon..... 22.50
Summerlee..... 22.50
Balmington..... 22.50
Glen..... 22.50

Rails.

Steel, at Eastern mills..... 39.00
Old Rails, T.S..... 22.50

Wrought, 7/8 ton, from store..... 24.50

Bar Iron from Store.

3/4 to 2 in. round and square..... 2.30
1 to 6 in. 2 1/2 to 1 in..... 2.30

Refined Iron.

3/4 to 2 in. round and square..... 2.40
1 to 6 in. 2 1/2 to 1 in..... 2.40

1 to 6 in. 2 1/2 to 1 in..... 2.50
Rods—3/4 and 1-1/2 round and sq..... 2.50
Rods—1 to 2-1/2 round and sq..... 2.50
Burdens' Best Iron, base price..... 3.50
Burdens' "H. B. & S." Iron, base price..... 3.50

Norway Rods..... 3.00

Sheet Iron from Store.

Common..... 2.85
American..... 3.00
R. G. G..... 3.15

10 to 16..... 3.15
17 to 20..... 3.15
21 to 24..... 3.15
25 to 28..... 3.15
29 to 32..... 3.15

Galvanized 16 to 20..... 4.50
Galvanized 21 to 24..... 4.50
Galvanized 25 to 28..... 4.50
Galvanized 29 to 32..... 4.50

American Russia..... 4.50
Russia..... 4.50
American Cold Rolled B. B..... 5.00

Iron Wire. (See Wire.)

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb or less, 45¢ ad. val.; valued above 4¢ and not above 7¢, 25¢ ad. val.; valued above 7¢ and not above 10¢, 15¢ ad. val.; valued above 10¢, 10¢ ad. val. Extra—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 15¢ ad. val. in addition to above; Steel Circular Saw Plates, 1¢ ad. val. in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, 3/8 to 3 inches, net..... 10 @ 14¢

Adamantine Shoes and Dies..... 8 @ 1¢

Magnet Steel..... 14 @ 1¢

English Steel.

Best Cast..... 14 @ 15¢

Extra Cast..... 14 @ 15¢

Circular Saw Plates..... 14 @ 15¢

Swaged Cast..... 14 @ 15¢

Best Double Steel..... 14 @ 15¢

Blister, 1st quality..... 14 @ 15¢

German Steel, Best..... 14 @ 15¢

2d quality..... 14 @ 15¢

3d quality..... 14 @ 15¢

Sheet Cast Steel, 1st quality..... 14 @ 15¢

2d quality..... 14 @ 15¢

3d quality..... 14 @ 15¢

TIN.—Duty: Plates, Sheets, Targers and Terges, 1¢ per lb; Bars, Block and Pig free.

Banca..... 24 @ 25¢

Strait..... 24 @ 25¢

English..... 24 @ 25¢

Bar..... 24 @ 25¢

Charcoal Tin Plates.

C 10x14 225 sheets..... 5.00 @ 6.875

C 12x18 225 sheets..... 5.00 @ 6.875

C 20x28 112..... 10.25 @ 14.75

X 10x14 225 sheets..... 6.00 @ 9.375

X 12x18 225 sheets..... 6.00 @ 9.375

X 14x20 112..... 6.00 @ 9.375

D C 12x18 100..... 5.00 @ 5.75

D X 12x18 100..... 6.00 @ 7.25

For each additional X add..... 1.25 @ 2.25

Coke Tin Plates.

Best..... 4.50 @ 4.50

C 14x20..... 4.50 @ 4.50

C 12x18..... 4.50 @ 4.50

C 10x14, gutters, 225 sheets..... 5.00 @ 5.25

C 20x28 112 sheets..... 9.00 @ 9.50

Tarred Plates.

Prime Char. 2d. quality..... \$13.25

C 14x20 Old Process..... 13.25

C 20x28..... 4.25 @ 4.75

X 14x20..... 5.75 @ 6.00

C 20x28..... 8.75 @ 9.00

X 20x28..... 11.00 @ 12.00

Tin Boiler Plates.

1XX 14x20, 2 sheets for No. 7, 112 sheets..... \$12.00

1XX 14x20, 2 " " No. 8..... 13.00

1XX 14x20, 2 " " No. 9..... 15.00

COPPER.—Duty: Pig, Bar and Ingot, 4¢. Old Copper, 3¢. Manufactured, including all articles of which Copper is a component of chief value, 35¢ ad valorem.

Ingot, Lake..... 10 @ 10¢

Ingot, Baltimore..... 10 @ 10¢

Ingot Anchor..... 10 @ 10¢

Cold Rolled Sheet.

16 oz. per square foot, and heavier..... 19¢

14 oz. and up to 16 oz. per square foot..... 21¢

12 oz. and up to 14 oz. per square foot..... 23¢

10 oz. and up to 12 oz. per square foot..... 25¢

8 oz. and up to 10 oz. per square foot..... 27¢

6 oz. and up to 8 oz. per square foot..... 29¢

4 oz. and up to 6 oz. per square foot..... 31¢

2 oz. and up to 4 oz. per square foot..... 33¢

For tuning boiler sizes, 7 in. 14 x 56..... each, 12¢

For tuning boiler sizes, 7 in. 14 x 56..... each, 12¢

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For tuning boiler sizes, 7 in. 14 x 56..... each, 12¢

LEAD.—Duty: Pig, 2¢ per 100 lb; Old Lead, 2¢ per 100 lb; Pipe and Sheet, 3¢ per 100 lb.

Pig..... 45¢

Bar..... 45¢

Pipe..... 45¢

Block Tin Pipe..... 45¢

Tin Lined Pipe..... 45¢

Sheet..... 45¢

Shot, 25 lb bag..... 45¢

Chilled Shot, 25 lb bag..... 45¢

ANTIMONY.

Hallett's..... 9 @ 9¢

Cookson..... 9 @ 9¢

SPELTER.—Duty: Pigs, Bars and Plates, \$1.50 per 100 lbs.

American, cash..... 45¢

Bergensport..... 45¢

ZINC.—Duty: Pig or Block, \$1.50 per 100 lbs.

Sheet, 24¢ per lb..... 63¢

Zinc—Open..... 7¢

Zinc Tubing..... 10 @ 30¢

PAINTS, OILS, &c.

Paints.

Black Lamp—Coach Painters..... 25¢

Black Lamp—Ordinary..... 25¢

Black Lamp—Terry Drive (all)..... 25¢

Black Paint, in oil..... 40¢

Blue, Prussian, fair to best..... 40¢

Chinese dry..... 15¢

Ultramarine..... 15¢

Brown, Spanish..... 15¢

Van Dyke..... 15¢

Dryers, Patent American..... 15¢

Green Chrome..... 15¢

Paris..... 15¢

In oil..... 15¢

Iron Paint, Bright Red..... 15¢

White, Prussian, fair to best..... 15¢

Ground in oil, Bright Red..... 15¢

Ground in oil, White..... 15¢

Ground in oil, Purple..... 15¢

Litharge..... 25¢

Orange Mineral..... 25¢

Red Lead American..... 15¢

Venetian (Eng. dry)..... 15¢

In oil..... 15¢

Rose Pink..... 15¢

Sienna, American Raw, powdered..... 15¢

Burnt, powdered..... 15¢

Raw..... 15¢

Umber, Burnt, powdered..... 15¢

Raw, powdered..... 15¢

Vermilion, Chinese..... 15¢

American, Common..... 15¢

White Lead, American, pure dry..... 15¢

English..... 15¢

White Paris, English Prime..... 15¢

Yellow Ochre, French..... 15¢

Vermont..... 15¢

Yellow Chrome..... 15¢

Seatefoot..... 15¢

Zinc White, American No. 1, dry..... 15¢

No. 1, in oil..... 15¢

French (Paris Dry)..... 15¢

Oils.

Bleached Whale, 2 gal..... 40¢

Sperm, 2 gal..... 40¢

Fish Oil, Pressed..... 20¢

Lard, Prime Winter..... 40¢

Cylinder Oil..... 40¢

Machine..... 40¢

Engine..... 40¢

Limeed, raw, in casks and bbls..... 40¢

Boiled..... 40¢

Western..... 40¢

Calcutta..... 40¢

Seatefoot..... 40¢

Cotton Seed, Refined..... 40¢

Sandries.

Asphaltum, Cuban, 2 gal..... 25¢

Benizine, 2 gal..... 25¢

Coal Tar..... 25¢

Chalk, 100 lb..... 25¢

Crucibles No. 14 and upward, per number..... 25¢

Grain Emery, 300 lb kegs..... 25¢

Flour Emery, fine quality..... 25¢

Frontiers..... 25¢

Glue, White..... 25¢

Sheet..... 25¢

Glaziers' Putty, Zinc, 2 gal..... 25¢

Gum, Copal..... 25¢

Damar..... 25¢

Shells, English..... 25¢

Dark..... 25¢

Mineral Wool, ordinary, 2 gal..... 25¢

Extra..... 25¢

Naphtha, 70°..... 25¢

Naphtha, 70°..... 25¢

Pumice Stone..... 25¢

Putty, in bladders..... 25¢

Putty, in bulk..... 25¢

Putty, in bulk..... 25¢

IRON AND STEEL.

Market Wire.—Put up in 65 lb bundles.

Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10 11 11 1/2 12 13 14 15 16

Bright Market Wire..... 45¢

Charcoal..... 45¢

Bale Wire, Nos. 7 to 12..... 45¢

Annealed Market Wire..... 45¢

Fence Wire, Nos. 8 and 9, 10, 11, 12..... 45¢

Grape Wire, Nos. 10 to 14..... 45¢

Coppered Market Wire..... 45¢

Bale Wire, Nos. 7 to 12..... 45¢

Galvanized Market Wire..... 45¢

Fence Wire..... 45¢

Stone or Weaving Wire.

Nos. 16 to 18..... 25¢

Nos. 19 to 21..... 25¢

Nos. 22 to 24..... 25¢

Nos. 25 to 27..... 25¢

Nos. 28 to 30..... 25¢

Nos. 31 to 33..... 25¢

Nos. 34 to 36..... 25¢

Nos. 37 to 39..... 25¢

Nos. 40 to 42..... 25¢

Nos. 43 to 45..... 25¢

Nos. 46 to 48..... 25¢

Nos. 49 to 51..... 25¢

Nos. 52 to 54..... 25¢

Nos. 55 to 57..... 25¢

Nos. 58 to 60..... 25¢

Nos. 61 to 63..... 25¢

Nos. 64 to 66..... 25¢

Nos. 67 to 69..... 25¢

Nos. 70 to 72..... 25¢

Nos. 73 to 75..... 25¢

Nos. 76 to 78..... 25¢

Nos. 79 to 81..... 25¢

Nos. 82 to 84.....

Stearns' Silent Saw Vises.

E. C. Stearns & Co., Syracuse, N. Y., whose general Western agents are H. H. & C. L. Munger, Chicago, Ill., have recently made an improvement in their saw vises, which are known to the trade. The im-



Fig. 1—Silent Saw Vise, No. 10.

provement consists in the addition of a third jaw to the vise. This jaw is faced with solid rubber, and presses against the side of the saw, under and parallel with the metal jaws, effectually preventing vibration, and thus

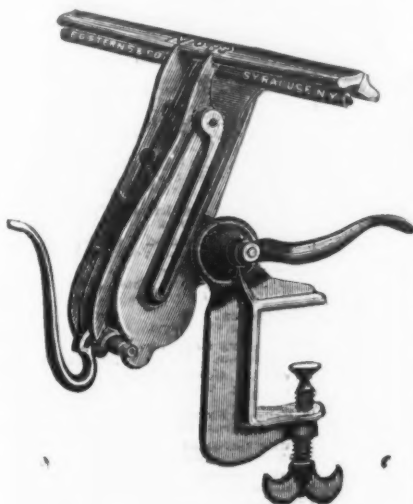


Fig. 2—Silent Saw Vise, No. 32.

greatly reducing the noise while a saw is being filed. It is brought into position after the saw has been gripped by the metal jaws, the same lever operating them having a cam which operates the rubber jaw when the lever is pushed home. The new vise is made in two styles, No. 10, shown in Fig. 1, being made for permanent attachment to a bench or frame, and No. 32, shown in Fig. 2, being provided with a clamp to fasten on the bench. The No. 32 has also a patent ball and socket joint of ingenious construction, which enables an operator to set the vise at any angle desired. The utility of this feature is alluded to as affording a great convenience in filing saw teeth to a particular bevel. A handsome revolving stand for the display of vises is furnished free to dealers selling the goods.

A New Lock and Knob.

Bullard & Gormley, of Chicago, are about to put upon the market a line of locks and knobs patented a short time since which possesses special features. We show in Fig. 1 of the illustrations a general view of a mortise lock of this description, with a part of the case broken away, re-

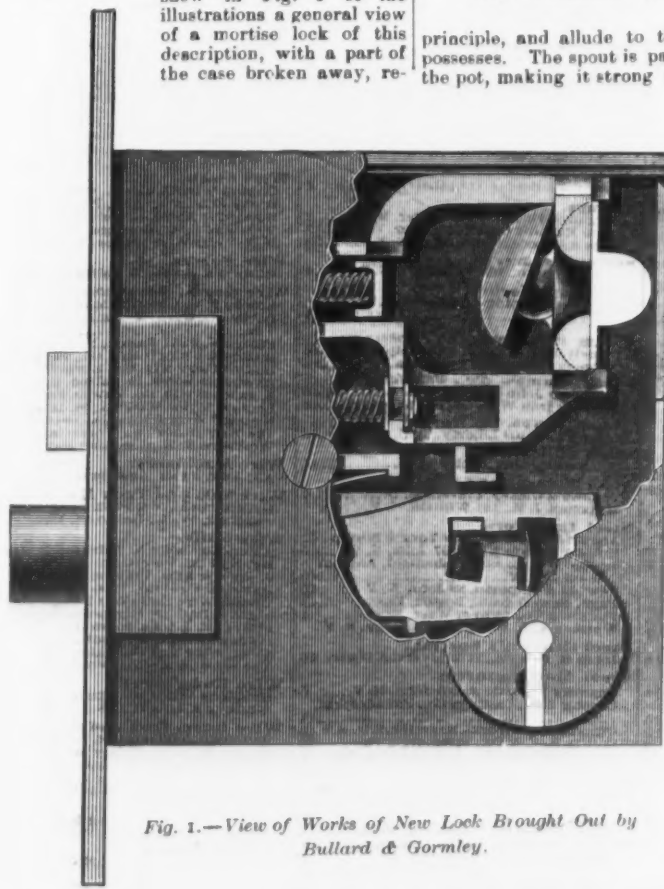


Fig. 1—View of Works of New Lock Brought Out by Bullard & Gormley.

vealing the interior mechanism. Fig. 2 shows a knob or spindle, which indicates the peculiar principle upon which it operates. The construction of the lock is simple, being of the kind known as the "easy spring latch," with the hub left out. In its construction there is an elongated opening in the case,

through which the knob shank is inserted. By sliding it horizontally forward it is securely fastened, and when the escutcheon is screwed to the door the knob shank is securely fastened to its place the same as if it was a part of the door itself. The second of our engravings shows a detail of the yoke, which is operated by the cam on the end of the knob shank. It will be seen that the bearing for the shank of the knob is conical in shape, and that the parts fit accurately together, thus overcoming all lost motion. The two knobs, when placed in position, bear against opposite sides of the piece represented in Fig. 3, and each has its own bearing in the yoke. Accordingly, each is turned independent of the other. The escutcheon used with these locks is of peculiar shape, and inside of the projecting boss, which surrounds the shank of the knob, ribs are cast which give the knob a long bearing which successfully resists rattling or looseness. No adjustment to the thickness of the door is required. The parts accommodate themselves, and the only difference in using two locks of the same kind on doors of different thickness would be the slight difference in space between the knob and the face of the escutcheon. The lock, it will be noticed, is furnished with a round bolt. The makers direct attention to the fact that there is no lost motion in any of the parts of which this article is composed; that there are no loose spindles, screws or washers, and that the rattling and shaking so common to the old spindle knob is successfully overcome.

Galvanized-Iron Sprinkling Pot.

The accompanying illustrations represent a new and improved galvanized-iron sprinkling pot, which has recently been put on the

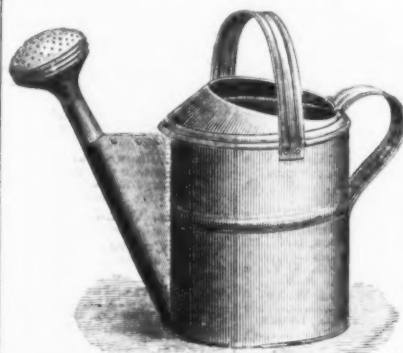


Fig. 1.—New Galvanized Iron Sprinkling Pot.

market by Whiting & Co., 468 and 470 Cherry street, New York. The manufacturers refer to it as constructed on a new

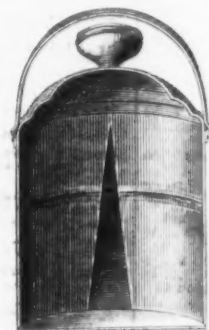


Fig. 2.—Showing Construction.

principle, and allude to the advantages it possesses. The spout is part and parcel of the pot, making it strong and durable, and

rapid and well distributed delivery. The rose or sprinkling tip is removable by a turn-screw for clearing and cleansing purposes. The handles are described as strongly affixed by heading, wiring and riveting. The pot is made up and put together in black iron and galvanized afterward, and the manufacturers refer to it as thus practically one solid piece of metal, and as nearly indestructible as possible. It is made in 6, 8, 10, 12 and 16 quart sizes.

Spring Steel Board Rules.

The Lufkin Rule Company, Cleveland, Ohio, are making the nickel-plated spring steel board rules, which are illustrated in

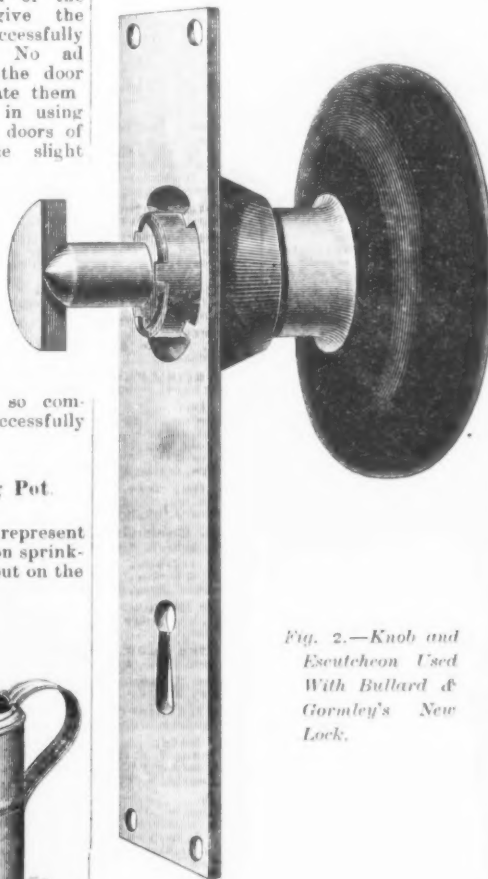
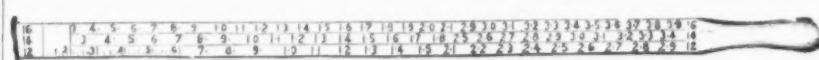


Fig. 2.—Knob and Escutcheon Used With Bullard & Gormley's New Lock.

the accompanying engraving. This article has been put on the market to meet the demand for a board rule that is practically indestructible, yet not clumsy to handle. It is described as made of the best English steel, and is warranted to be of the finest spring temper. The weight of the steel rule does not exceed that of the wooden one, as it is not necessary to make it as wide or thick. The head is of steel, and is alluded to as very strong, being the same style of



Spring Steel Board Rules.

head that the company put on their best rules. The handle is made to conform to the shape of the hand. With reference to the figures and divisions, the company state that they use a plain black figure, and make the divisions with a good-sized diamond-shaped dot, the points of which give the exact measurement. The diamond is referred to as preferable to a line, being more distinguishable, and not weakening the rule. The figures and divisions are black and easily read. In order to prevent rusting, the rule is nickel-plated and coated with a fine lacquer, which is baked on to the steel and forms an impervious coating. But before nickel plating, a dead surface is given to the steel which takes away the glare or reflection when used in the sunlight. These rules are made in 2½, 3 and 3½ feet.

Gauge for Hanging Doors.

Reed & Auerbach, 229 Bowery, New York, are introducing to the trade Plante's Gauge for hanging doors, a general view of which is afforded in accompanying engraving.

The gauge consists of an oblong block of wood provided on one face, at the ends, with surface plates to prevent wearing. Through this block are inserted accurate working gauge rods, so adjusted and arranged as to provide in one tool all the necessary tools required in setting butts in hanging a door. Referring to the engraving, it will be seen that the blades A and B are contained in a single rod working cross-wise of the block. The point A works downwardly from the rod, while the point B extends in the opposite direction. The blade A is used for cutting the length and depth for insertion of the hinge on the door. When the blade A has been correctly set, the blade B is then in position for cutting the length and depth on the door jamb. In the construction of the tool in this particular there is an allowance of 1/16 inch for required slackness between the door and the door-step. This allowance can be varied within certain limits by placing a strip of paper under the blade B when adjusting it. By this means the utmost nicety of fit can be obtained. The blade C is used for marking the depth on the door and the door casing. The inventor claims for this tool that it not only finishes the hanging of a door in a most excellent and workmanlike manner, but at

the same time saves labor, enabling the workman to hang two doors in the time that is commonly required to hang one.

The Hurd Patent Respirator.

The Morley Respirator Company, East Saginaw, Mich., are manufacturers of this article, which is represented in use in the accompanying illustration. Its object will be readily apprehended as the protection of the throat and lungs from dust, poisonous gases, and other impurities, and it is especially intended for use where emery wheels are employed in white lead works, chemical works, glass and blast furnaces, planing mills, &c., as well as other places where dust, foul air, &c., have to be encountered. The respirator consists, as indicated by the cut, of an elastic rubber mouthpiece, which is held in position by an elastic rubber band. The air enters through the openings in the front of the respirator, and passes through a damp sponge, which is there held in place by a flange on the inside. When the air is discharged from the lungs it finds a way of escape through the opening, which is represented in the upper portion of the respirator, in which there is a mica valve, which opens very readily, permitting the air thus to be discharged. The operation of this valve prevents the entrance of the air through it, so that all the air breathed is drawn through the wet sponge. Breathing with the respirator is referred to

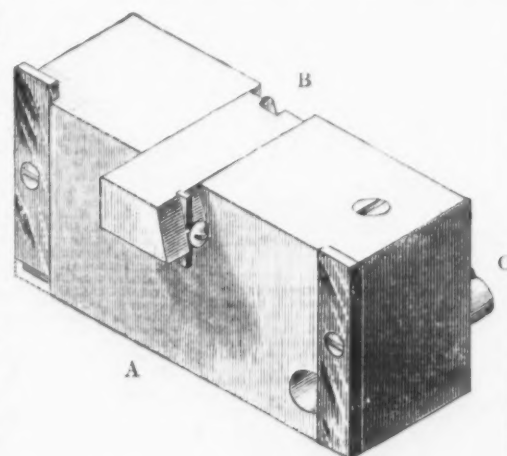


The Hurd Patent Respirator.

as easy, allowing it to be worn constantly without the least inconvenience. The durability of this article is referred to, and the efficiency with which it does its work. Information as to its price is given in the trade report.

The A. A. Griffing Iron Company, 454 Communipaw avenue, Jersey City, with branch office at 42 and 44 West Monroe

street, Chicago, send us their 1886-87 catalogue and price list of the Bundy patent radiators which they manufacture. In their announcement the manufacturers state that the many improvements made in the Bundy radiator since their last catalogue was issued has made it necessary to publish a new and more complete one, in which they have endeavored to so list their goods as to enable patrons to easily determine prices, style and dimensions of radiators required. Among the improvements to which special attention is directed is their hot-water and hot-cold dining-room radiators. Mention is also made of the fact that the patents referred to in this catalogue are owned and used exclusively by this company. During the past year the A. A. Griffing Iron Company have erected additional buildings, and purchased new machinery, especially designed for their work, thus largely increasing their facilities. The significant statement is made that their establishment is the largest one in the world exclusively engaged in the manufacture of radiators. A general invitation is given to those who contemplate purchasing heating apparatus to visit these works, where facilities will be



Plante's Gauge Block for Hanging Doors.

extended for inspecting the goods in the different stages of manufacture, and an exhibition of the working qualities of their radiators will be given. The catalogue opens with an extensive telegraph code, which is followed by a short account of the advantages of steam as compared with furnace heating, and a general description of the Bundy radiator. Next

comes illustrations with accompanying tables of sizes and prices of the different styles of the Bundy direct radiator, the Bundy hot-cold dining-room radiator, the Bundy indirect radiator of different styles, with plain and extended surface, and G.D.'s pin indirect radiator. In the succeeding division of the catalogue, sectional and perspective views are given of the different Bundy radiator loops, and the Thompson radiator loop. The next few pages are devoted to direct indirect radiators, after which the subject of hot-water radiators is taken up. The catalogue proper closes with illustrations and price list of vertical tube, antique brass direct radiator screens. Some 40 pages at the back of the catalogue are occupied with testimonial letters, printed in fac-simile, and a long list of references. The catalogue is a volume some 9½ x 12 inches in size, tastefully bound in dark green cloth. The paper is of fine quality, the engravings are carefully executed, and the letter-press excellent, making the whole a very handsome volume.

The Master Mechanics' Convention.

The business arranged for consideration at the approaching Master Mechanics' Convention gives good ground for the expectation that the meeting will prove both profitable and interesting. Eight subjects are under the investigation of committees. Most of them, says the *National Car and Locomotive Builder*, are in the hands of energetic workers, who are likely to bring out all facts worthy of attention. Nearly all the subjects offer ground for conflicting views, and several of them have already been discussed in railroad clubs.

Proportion of locomotive cylinders, a most important subject, which has received too little consideration from designers, is in the hands of Charles Blackwell, F. L. Wanklyn and T. E. Barnett. Mr. Blackwell has devoted great attention to this subject, and his views are certain to reflect a clear light where much darkness yet prevails.

Traction increases is under investigation by R. H. Briggs, D. O. Shaver and T. J. Hatswell. Mr. Briggs has been a warm advocate of traction increases where they were likely to do any good, and Mr. Hatswell also has had some experience with them, so the association is likely to learn more about the effects on locomotives of traction increases than has hitherto been known.

Cross-heads and guide-bars, an important feature toward securing safety and durability to the working parts of locomotives, is under investigation by N. W. Howison and J. B. Henney, both of whom have had considerable experience in the building of locomotives, and are likely to judge fairly the merits of the various types.

Steam packing, which includes the various forms of piston packing, and aims to find out the most economical and satisfactory packing for piston rods, valve stems, regulator and air-pump stuffing-boxes, is in the hands of J. W. Stokes, Allen Cooke and Henry Schlacks, and all of them are working industriously to obtain the facts necessary for a full report.

Locomotive preparation, an important subject which has received a singularly small share of attention in the past, will be reported on by G. W. Ettinger, W. H. Thomas and F. W. Gentry, all comparatively new but able members. The subject embraces washing and lighting up locomotives, showing the best system in use for washing out, and most economical and expeditious mode of raising steam and the necessary plant for the same. Methods of washing out have been improved from time to time, and they are now fairly efficient in the regions where bad water makes washing out an important operation; but high up remains practically where it was 50 years ago. If the committee succeed in devising means of firing up that will dispense with the ancient woodpile, the members will earn the gratitude of all the railroads in America.

Coaling up locomotives is another subject that has been little discussed, probably because on many roads the motive-power department has nothing to do with handling coal, and the average master mechanic who has that work under his charge wishes it was in other hands. The subject is in the hands of J. Davis Barnett, James Strode and Charles Graham. On most roads the tenders are loaded with coal by the crudest kind of appliances so far as regarding accuracy of supply is concerned. In fact, the quantity of coal put on is a matter of guesswork. While a company cannot tell with any degree of accuracy how much coal has been supplied to the various locomotives, the officers cannot with justice hold engineers very strictly to account for fuel wasted. If the report of this committee leads to improvements in the methods of handling coal, it will effect an important work toward fuel saving.

Standard form of tire section is a subject continued, and is practically closed in a way that reflects great credit on the committee, J. N. Lauder, Jacob Johann and N. H. Sprague.

What control has the engineer over the wear of the driving wheel tire? Is a question of the utmost importance that John Mackenzie, J. S. Graham and Fred. B. Griffith are trying to get answered.

The Burlington Brake Tests.—The Park electric brake, of Chicago, to which we referred a short time ago, will not enter the Burlington (Iowa) brake tests after all. Mr. Park withdraws for the sole reason that he has been disappointed in getting his cars, his brakes being all ready. This will leave the list of contestants, as now understood, to be: Westinghouse, Eames, Hanscom, Card, American (the American company will enter an air-brake this year), Widfield & Button, Carpenter and Boyden. The Rote brake will, we are informed, also come in. The Ward will not, as far as now known, come in, having failed to get cars. The American driver brake and the Rote driver brake are expected to be on the ground. The Westinghouse driver-brake will, of course, be there. The cars of the Eames, Hanscom and Westinghouse companies are already at Burlington.

WHOLESALE METAL PRICES, MAY 11, 1887.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 11-10¢ per lb.; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-10¢ to 15-10¢ per lb. Band, Hoop and Scrolled, 1¢ to 1-4-10¢ per lb. Railroad Bars weighing more than 35 lb per yard, 7-10¢ to 1¢ per lb.

Standard American Pig Iron.

Foundry No. 1 X	ton	\$21.50	to	\$25.00
Foundry No. 2 X	ton	20.00	to	23.00
Gray Forge	ton	18.50	to	19.00

No. 1 Scotch Pig Iron.

Carnegie	ton	\$21.50	to	\$22.75
Coltess	ton	22.50	to	23.00
Shotts	ton	22.50	to	23.00
Glenbrook	ton	22.50	to	23.00
Gartshore	ton	22.50	to	23.00
Langloan	ton	22.50	to	23.00
Summerlee	ton	21.75	to	21.00
Dalmellington	ton	20.50	to	21.00
Edinburgh	ton	20.50	to	21.00
Girdle	ton	20.50	to	20.75

Rails.

Steel, at Eastern mills	ton	\$30.00	to	\$40.00
Old Rails, Td.	ton	22.50	to	23.00

Wrought, ton, from yard.

Wrought, ton, from yard	ton	\$24.00	to	\$24.50
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Bar Iron from Store.

Common, round	ton	\$2.00	to	\$2.50
Refined iron	ton	2.40	to	2.60

Sheet Iron from Store.

Common	ton	\$2.85	to	\$3.45
Cleaned	ton	3.00	to	3.50

Galvanized 16 to 20.

Galvanized 16 to 20	ton	\$4.80	to	\$5.40
Galvanized 21 to 24	ton	5.25	to	5.85

Galvanized 25 to 30.

Galvanized 25 to 30	ton	\$6.00	to	\$6.60
Galvanized 31 to 36	ton	6.50	to	7.10

American Cold Rolled B.

American Cold Rolled B.	ton	\$10.00	to	\$11.00
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Iron Wire.—(See Wire.)

STEEL.—DUTY: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 5¢ ad. val.; valued above 4¢ and not above 10¢ per lb., 2½¢ ad. val.; valued above 10¢ per lb., 3½¢ ad. val. Extra.—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1½¢ ad. val. in addition to the above. Steel Circular Saw Plates, 1¢ ad. val. in addition to the above.

For American Steel, see Pittsburgh quotations.

Chromed Steel.

Chromed Steel	ton	\$10.00	to	\$14.00
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English Steel.

English Steel	ton	\$14.00	to	\$15.00
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Best Cast.

Best Cast	ton	\$10.00	to	\$11.00
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Circular Saw Plates.

Circular Saw Plates	ton	\$10.00	to	\$11.00
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Swaged, Cast.

Swaged, Cast	ton	\$10.00	to	\$11.00
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Best Double Shear.

Best Double Shear	ton	\$10.00	to	\$11.00
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Blister, 1st quality.

Blister, 1st quality	ton	\$10.00	to	\$11.00
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German Steel, Best.

German Steel, Best	ton	\$10.00	to	\$11.00
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3d quality.

3d quality	ton	\$10.00	to	\$11.00
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Sheet Cast Steel, 1st quality.

Sheet Cast Steel, 1st quality	ton	\$10.00	to	\$11.00
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3d quality.

3d quality	ton	\$10.00	to	\$11.00
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TIN.—DUTY: Bars, Plates, and Pig free.

TIN.—DUTY: Bars, Plates, and Pig free	ton	\$24.00	to	\$24.50
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Banca.

Banca	ton	\$24.00	to	\$24.50
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Strait.

Strait	ton	\$24.00	to	\$24.50
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English.

English	ton	\$24.00	to	\$24.50
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Bar.

Bar	ton	\$24.00	to	\$24.50
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Charcoal Tin Plates.

Charcoal Tin Plates	ton	\$5.00	to	\$5.50
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C 10x14 25 sheets.

C 10x14 25 sheets	box	\$5.00	to	\$5.50
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C 12x18 25 sheets.

C 12x18 25 sheets	box	\$5.00	to	\$5.50
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C 20x28 112.

C 20x28 112	box	\$5.00	to	\$5.50
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X 10x14 25 sheets.

X 10x14 25 sheets	box	\$5.00	to	\$5.50
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X 12x18 25 sheets.

X 12x18 25 sheets	box	\$5.00	to	\$5.50
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X 14x20 112.

X 14x20 112	box	\$5.00	to	\$5.50
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D C 12x18 100.

D C 12x18 100	box	\$5.00	to	\$5.50
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D X 12x18 100.

D X 12x18 100	box	\$5.00	to	\$5.50
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For each additional X add.

For each additional X add	ton	\$1.25	to	\$1.50
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Coke Tin Plates.

Coke Tin Plates	ton	\$4.50	to	\$5.00
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C 10x14.

C 10x14	box	\$4.50	to	\$5.00
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C 12x18.

C 12x18	box	\$4.50	to	\$5.00
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C 20x28, gutters, 25 sheets.

C 20x28, gutters, 25 sheets	box	\$4.50	to	\$5.00
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C 20x28 112 sheets.

C 20x28 112 sheets	box	\$4.50	to	\$5.00
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Terne Plates.

Terne Plates	ton	\$13.25	to	\$13.50
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C 14x20 M.F. 3d quality.

C 14x20 M.F. 3d quality	box	\$13.25	to	\$13.50
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C 14x20 Old Process.

C 14x20 Old Process	box	\$13.25	to	\$13.50
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C 20x28.

C 20x28	box	\$13.25	to	\$13.50
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X 14x20.

X 14x20	box	\$13.25	to	\$13.50
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X 12x18.

X 12x18	box	\$13.25	to	\$13.50
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X 10x14.

X 10x14	box	\$13.25	to	\$13.50
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X 8x10.

X 8x10	box	\$13.25	to	\$13.50
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X 6x8.

X 6x8	box	\$13.25	to	\$13.50
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Tin Boilers.

Tin Boilers	ton	\$12.00	to	\$12.50
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IXX 14x26, 2 sheets for No. 7, 112 sheets.

IXX 14x26, 2 sheets for No. 7, 112 sheets	box	\$12.00	to	\$12.50
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IXX 14x26, 2 No. 8.

IXX 14x26, 2 No. 8	box	\$12.00	to	\$12.50
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IXX 14x26, 2 No. 9.

IXX 14x26, 2 No. 9	box	\$12.00	to	\$12.50
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COPPER.—DUTY: Pig, Bar and Ingot, 4¢.

COPPER.—DUTY: Pig, Bar and Ingot, 4¢	ton	\$10.00	to	\$11.00
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Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem	ton	\$10.00	to	\$11.00
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Ingot, Lake.

Ingot, Lake	ton	\$10.00	to	\$11.00
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Ingot, Baltimore.

Ingot, Baltimore	ton	\$10.00	to	\$11.00
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Ingot, Anchor.

Ingot, Anchor	ton	\$10.00	to	\$11.00
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Cold Rolled Sheet.

Cold Rolled Sheet	ton	\$10.00	to	\$11.00
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Tinning.

Tinning	ton	\$10.00	to	\$11.00
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Sheathing copper, (14 x 48).

Sheathing copper, (14 x 48)	ton	\$10.00	to	\$11.00
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Copper Bottoms.

Copper Bottoms	ton	\$10.00	to	\$11.00
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O'Neill's Patent Plated Copper, Net.

O'Neill's Patent Plated Copper, Net	ton	\$10.00	to	\$11.00
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Boiler Sizes.

Boiler Sizes	ton	\$10.00	to	\$11.00
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Sheathing Metal.

Sheathing Metal	ton	\$10.00	to	\$11.00
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BRASS AND GERMAN SILVER.

BRASS AND GERMAN SILVER	ton	\$10.00	to	\$11.00
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Brown & Sharpe's Gauge the Standard for Metal.

Brown & Sharpe's Gauge the Standard for Metal	ton	\$10.00	to	\$11.00
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Old English Gauge the Standard for Wire.

Old English Gauge the Standard for Wire	ton	\$10.00	to	\$11.00
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Manufacturers' Price List, January 1, 1884.

Manufacturers' Price List, January 1, 1884	ton	\$10.00	to	\$11.00
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ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.

ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.

SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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ANTHONY.

ANTHONY	ton	\$10.00	to	\$11.00
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COOKSON.

COOKSON	ton	\$10.00	to	\$11.00
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ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.

ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.

SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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ANTHONY.

ANTHONY	ton	\$10.00	to	\$11.00
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COOKSON.

COOKSON	ton	\$10.00	to	\$11.00
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ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.

ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.

SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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ANTHONY.

ANTHONY	ton	\$10.00	to	\$11.00
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COOKSON.

COOKSON	ton	\$10.00	to	\$11.00
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ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.

ZINC.—DUTY: Pig, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.

SPELTER.—DUTY: Pigs, Bars and Plates, \$1.50 per 100 lbs.	ton	\$10.00	to	\$11.00
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ANTHONY.

ANTHONY	ton	\$10.00	to	\$11.00
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COOKSON.

Stearns's Silent Saw Vises.

E. C. Stearns & Co., Syracuse, N. Y., whose general Western agents are H. H. & C. L. Munger, Chicago, Ill., have recently made an improvement in their saw vises, which are known to the trade. The im-



Fig. 1—Silent Saw Vise, No. 10.

provement consists in the addition of a third jaw to the vise. This jaw is faced with solid rubber, and presses against the side of the saw, under and parallel with the metal jaws, effectually preventing vibration, and thus

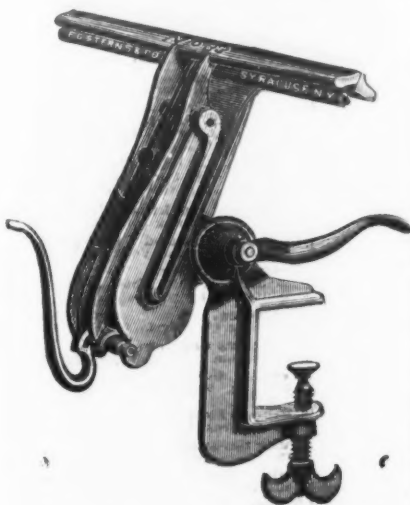


Fig. 2—Silent Saw Vise, No. 32.

greatly reducing the noise while a saw is being filed. It is brought into position after the saw has been gripped by the metal jaws, the same lever operating them having a cam which operates the rubber jaw when the lever is pushed home. The new vise is made in two styles, No. 10, shown in Fig. 1, being made for permanent attachment to a bench or frame, and No. 32, shown in Fig. 2, being provided with a clamp to fasten on the bench. The No. 32 has also a patent ball and socket joint of ingenious construction, which enables an operator to set the vise at any angle desired. The utility of this feature is alluded to as affording a great convenience in filing saw teeth to a particular bevel. A handsome revolving stand for the display of vises is furnished free to dealers selling the goods.

A New Lock and Knob.

Bullard & Gormley, of Chicago, are about to put upon the market a line of locks and knobs patented a short time since which possesses special features. We show in Fig. 1 of the illustrations a general view of a mortise lock of this description, with a part of the case broken away, re-

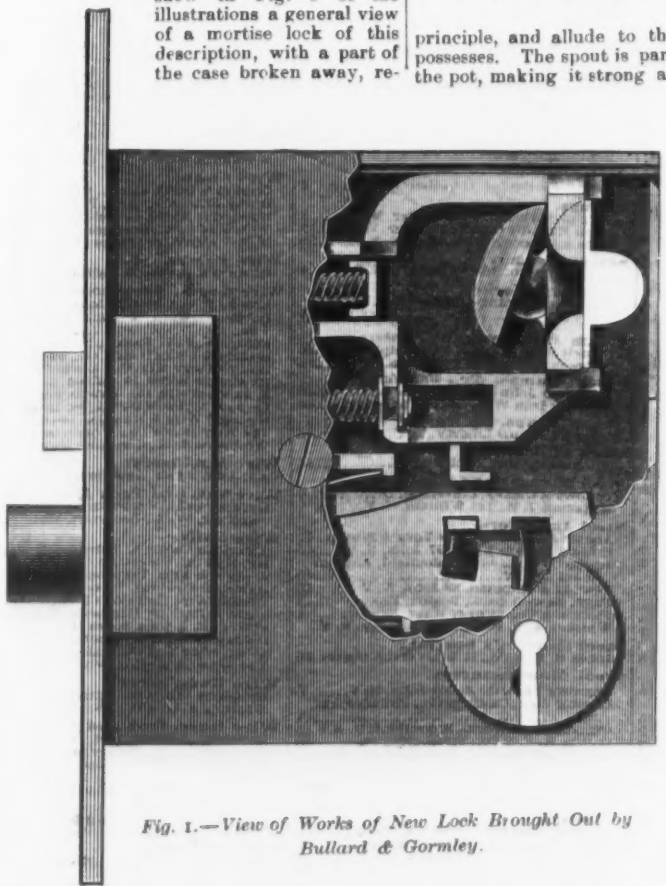


Fig. 1.—View of Works of New Lock Brought Out by Bullard & Gormley.

vealing the interior mechanism. Fig. 2 shows a knob or spindle, which indicates the peculiar principle upon which it operates. The construction of the lock is simple, being of the kind known as the "easy spring latch," with the hub left out. In its construction there is an elongated opening in the case,

through which the knob shank is inserted. By sliding it horizontally forward it is securely fastened, and when the escutcheon is screwed to the door the knob shank is securely fastened to its place the same as if it was a part of the door itself. The second of our engravings shows a detail of the yoke, which is operated by the cam on the end of the knob shank. It will be seen that the bearing for the shank of the knob is conical in shape, and that the parts fit accurately together, thus overcoming all lost motion. The two knobs, when placed in position, bear against opposite sides of the piece represented in Fig. 3, and each has its own bearing in the yoke. Accordingly, each is turned independent of the other. The escutcheon used with these locks is of peculiar shape, and inside of the projecting boss, which surrounds the shank of the knob, ribs are cast which give the knob a long bearing which successfully resists rattling or looseness. No adjustment to the thickness of the door is required. The parts accommodate themselves, and the only difference in using two locks of the same kind on doors of different thickness would be the slight difference in space between the knob and the face of the escutcheon. The lock, it will be noticed, is furnished with a round bolt. The makers direct attention to the fact that there is no lost motion in any of the parts of which this article is composed; that there are no loose spindles, screws or washers, and that the rattling and shaking so common to the old spindle knob is successfully overcome.

Galvanized-Iron Sprinkling Pot.

The accompanying illustrations represent a new and improved galvanized-iron sprinkling pot, which has recently been put on the

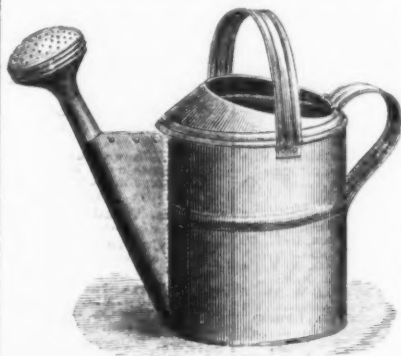


Fig. 1.—New Galvanized Iron Sprinkling Pot.

market by Whiting & Co., 468 and 470 Cherry street, New York. The manufacturers refer to it as constructed on a new

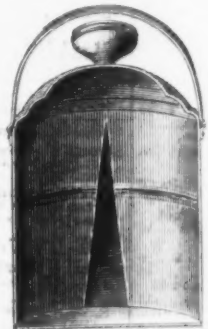


Fig. 2.—Showing Construction.

principle, and allude to the advantages it possesses. The spout is part and parcel of the pot, making it strong and durable, and

rapid and well distributed delivery. The rose or sprinkling tip is removable by a turn-screw for clearing and cleansing purposes. The handles are described as strongly affixed by heading, wiring and riveting. The pot is made up and put together in black iron and galvanized afterward, and the manufacturers refer to it as thus practically one solid piece of metal, and as nearly indestructible as possible. It is made in 6, 8, 10, 12 and 16 quart sizes.

Spring Steel Board Rules.

The Lufkin Rule Company, Cleveland, Ohio, are making the nickel-plated spring steel board rules, which are illustrated in

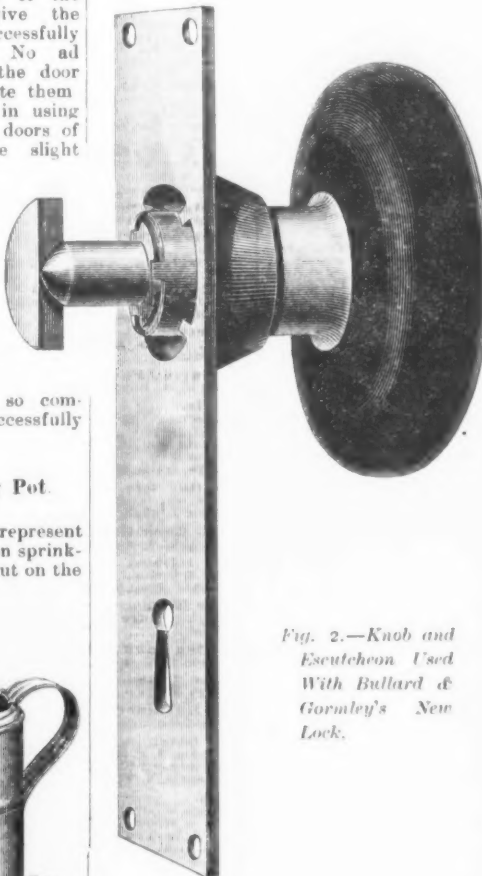
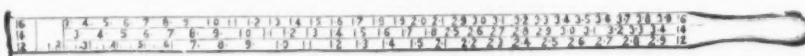


Fig. 2.—Knob and Escutcheon Used With Bullard & Gormley's New Lock.

the accompanying engraving. This article has been put on the market to meet the demand for a board rule that is practically indestructible, yet not clumsy to handle. It is described as made of the best English steel, and is warranted to be of the finest spring temper. The weight of the steel rule does not exceed that of the wooden one, as it is not necessary to make it as wide or thick. The head is of steel, and is alluded to as very strong, being the same style of



Spring Steel Board Rules.

head that the company put on their best rules. The handle is made to conform to the shape of the hand. With reference to the figures and divisions, the company state that they use a plain block figure, and make the divisions with a good-sized diamond-shaped dot, the points of which give the exact measurement. The diamond is referred to as preferable to a line, being more distinguishable, and not weakening the rule. The figures and divisions are black and easily read. In order to prevent rusting, the rule is nickel-plated and coated with a fine lacquer, which is baked on to the steel and forms an impervious coating. But before nickel plating, a dead surface is given to the steel which takes away the glare or reflection when used in the sunlight. These rules are made in 2 1/2, 3 and 3 1/2 feet.

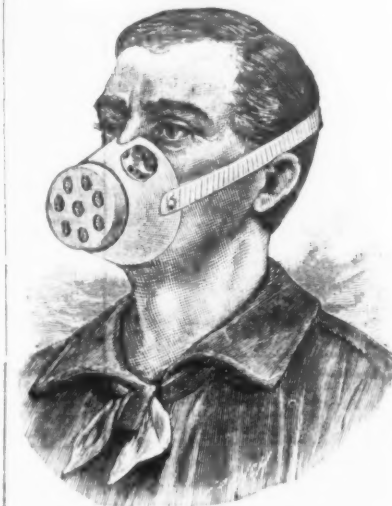
Gauge for Hanging Doors.

Reed & Auerbacher, 229 Bowery, New York, are introducing to the trade Plante's Gauge for hanging doors, a general view of which is afforded in accompanying engraving. The gauge consists of an oblong block of wood provided on one face, at the ends, with surface plates to prevent warping. Through this block are inserted accurate working gauge rods, so adjusted and arranged as to provide in one tool all the necessary tools required in setting butts in hanging a door. Referring to the engraving, it will be seen that the blades A and B are contained in a single rod working cross-wise of the block. The point A works downwardly from the rod, while the point B extends in the opposite direction. The blade A is used for cutting the length and depth for insertion of the hinge on the door. When the blade A has been correctly set, the blade B is then in position for cutting the length and depth on the door jamb. In the construction of the tool in this particular there is an allowance of 1/8 inch for required slackness between the door and the door-step. This allowance can be varied within certain limits by placing a strip of paper under the blade B when adjusting it. By this means the utmost nicety of fit can be obtained. The blade C is used for marking the depth on the door and the door casing. The inventor claims for this tool that it not only finishes the hanging of a door in a most excellent and workmanlike manner, but at

the same time saves labor, enabling the workman to hang two doors in the time that is commonly required to hang one.

The Hurd Patent Respirator.

The Morley Respirator Company, East Saginaw, Mich., are manufacturers of this article, which is represented in use in the accompanying illustration. Its object will be readily apprehended as the protection of the throat and lungs from dust, poisonous gases, and other impurities, and it is especially intended for use where emery wheels are employed in white lead works, chemical works, glass and blast furnaces, planing mills, &c., as well as other places where dust, foul air, &c., have to be encountered. The respirator consists, as indicated by the cut, of an elastic rubber mouthpiece, which is held in position by an elastic rubber band. The air enters through the openings in the front of the respirator, and passes through a damp sponge, which is there held in place by a flange on the inside. When the air is discharged from the lungs it finds a way of escape through the opening, which is represented in the upper portion of the respirator, in which there is a mica valve, which opens very readily, permitting the air thus to be discharged. The operation of this valve prevents the entrance of the air through it, so that all the air breathed is drawn through the wet sponge. Breathing with the respirator is referred to

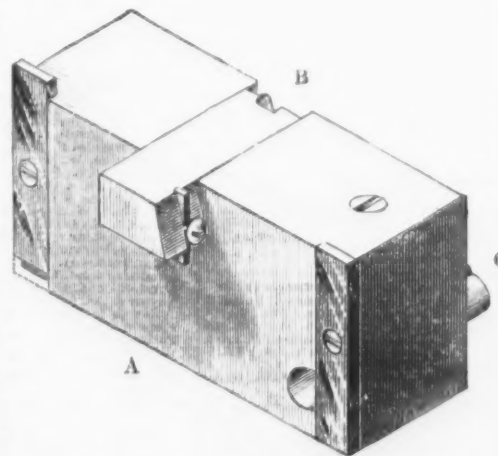


The Hurd Patent Respirator.

as easy, allowing it to be worn constantly without the least inconvenience. The durability of this article is referred to, and the efficiency with which it does its work. Information as to its price is given in the trade report.

The A. A. Griffing Iron Company, 454 Communipaw avenue, Jersey City, with branch office at 42 and 44 West Monroe

street, Chicago, send us their 1886-87 catalogue and price list of the Bundy patent radiators which they manufacture. In their announcement the manufacturers state that the many improvements made in the Bundy radiator since their last catalogue was issued has made it necessary to publish a new and more complete one, in which they have endeavored to so list their goods as to enable patrons to easily determine prices, style and dimensions of radiators required. Among the improvements to which special attention is directed is their hot-water and hot-closet dining-room radiators. Mention is also made of the fact that the patents referred to in this catalogue are owned and used exclusively by this company. During the past year the A. A. Griffin Iron Company have erected additional buildings, and purchased new machinery, especially designed for their work, thus largely increasing their facilities. The significant statement is made that their establishment is the largest one in the world exclusively engaged in the manufacture of radiators. A general invitation is given to those who contemplate purchasing heating apparatus to visit these works, where facilities will be



Plante's Gauge Block for Hanging Doors.

extended for inspecting the goods in the different stages of manufacture, and an exhibition of the working qualities of their radiators will be given. The catalogue opens with an extensive telegraph code, which is followed by a short account of the advantages of steam as compared with furnace heating, and a general description of the Bundy radiator. Next

comes illustrations with accompanying tables of sizes and prices of the different styles of the Bundy direct radiator, the Bundy hot-closet dining room radiator, the Bundy indirect radiator of different styles, with plain and extended surface, and G.I.'s pin indirect radiator. In the succeeding division of the catalogue, sectional and perspective views are given of the different Bundy radiator loops, and the Thompson radiator loop. The next few pages are devoted to direct-indirect radiators, after which the subject of hot water radiators is taken up. The catalogue proper closes with illustrations and price list of vertical tube, antique brass direct radiator screens. Some 40 pages at the back of the catalogue are occupied with testimonial letters, printed in *fac-simile*, and a long list of references. The catalogue is a volume some 9 1/2 x 12 inches in size, tastefully bound in dark green cloth. The paper is of fine quality, the engravings are carefully executed, and the letter-press excellent, making the whole a very handsome volume.

The Master Mechanics' Convention.

The business arranged for consideration at the approaching Master Mechanics' Convention gives good ground for the expectation that the meeting will prove both profitable and interesting. Eight subjects are under the investigation of committees. Most of them, says the *National Car and Locomotive Builder*, are in the hands of energetic workers, who are likely to bring out all facts worthy of attention. Nearly all the subjects offer ground for conflicting views, and several of them have already been discussed in railroad clubs.

Proportion of locomotive cylinders, a most important subject, which has received too little consideration from designers, is in the hands of Charles Blackwell, F. L. Wanklyn and T. E. Barnett. Mr. Blackwell has devoted great attention to this subject, and his views are certain to reflect a clear light where much darkness yet prevails.

Traction increasers is under investigation by R. H. Briggs, D. O. Shaver and T. J. Hatswell. Mr. Briggs has been a warm advocate of traction increasers where they were likely to do any good, and Mr. Hatswell also has had some experience with them, so the association is likely to learn more about the effects on locomotives of traction increasers than has hitherto been known.

Cross-heads and guide-bars, an important feature toward securing safety and durability to the working parts of locomotives, is under investigation by N. W. Howison and J. B. Henney, both of whom have had considerable experience in the building of locomotives, and are likely to judge fairly the merits of the various types.

Steam packing, which includes the various forms of piston packing, and aims to find out the most economical and satisfactory packing for piston rods, valve stems, regulator and air-pump stuffing-boxes, is in the hands of J. W. Stokes, Allen Cooke and Henry Schlacks, and all of them are working industriously to obtain the facts necessary for a full report.

Locomotive preparation, an important subject which has received a singularly small share of attention in the past, will be reported on by G. W. Ettenger, W. H. Thomas and F. W. Gentry, all comparatively new but able members. The subject embraces washing and lighting up locomotives, showing the best system in use for washing out, and most economical and expeditious mode of raising steam and the necessary plant for the same. Methods of washing out have been improved from time to time, and they are now fairly efficient in the regions where bad water makes washing out an important operation; but lighting up remains practically where it was 50 years ago. If the committee succeed in devising means of firing up that will dispense with the ancient woodpile, the members will earn the gratitude of all the railroads in America.

Coaling up locomotives is another subject that has been little discussed, probably because on many roads the motive-power department has nothing to do with handling coal, and the average master mechanic who has that work under his charge wishes it was in other hands. The subject is in the hands of J. Davis Barnett, James Strode and Charles Graham. On most roads the tenders are loaded with coal by the crudest kind of appliances so far as recording accuracy of supply is concerned. In fact, the quantity of coal put on is a matter of guesswork. While a company cannot tell with any degree of accuracy how much coal has been supplied to the various locomotives, the officers cannot with justice hold menemen very strictly to account for fuel wasted. If the report of this committee leads to improvements in the methods of handling coal, it will effect an important work toward fuel saving.

Standard form of tire section is a subject continued, and is practically closed in a way that reflects great credit on the committee, J. N. Lauder, Jacob Johann and N. H. Sprague.

What control has the engineer over the wear of the driving wheel tires? Is a question of the utmost importance that John Mackenzie, J. S. Graham and Fred. B. Griffith are trying to get answered.

The Burlington Brake Tests.—The Park electric brake, of Chicago, to which we referred a short time ago, will not enter the Burlington (Iowa) brake tests after all. Mr. Park withdraws for the sole reason that he has been disappointed in getting his cars, his brakes being all ready. This will leave the list of contestants, as now understood, to be: Westinghouse, Eames, Hanscom, Card, American (the American company will enter an air-brake this year), Widdifield & Button, Carpenter and Boyden. The Rote brake will, we are informed, also come in, having failed to get cars. The American driver brake and the Reule driver-brake are expected to be on the ground. The Westinghouse driver-brake will, of course, be there. The cars of the Eames, Hanscom and Westinghouse companies are already at Burlington. Next

A. Adams & Wilson, 91 Liberty, N. Y., 18
B. Braden & Co., 116 Richmond St., Phila., 5
Wm. H. Haskell Co., Pawtucket, R.I., 40
C. Chemicals.
Elmer & Amend, 205 Third av., N. Y., 9
D. Cherry Stokers.
Katherine Mfg. Co., Philadelphia, Pa., 43
E. Chisels, Manufacturers of.
Jock Bros., Millbury, Mass., 13
F. Chucks.
Almond T. R., Brooklyn, N. Y., 38
Fulton Mfg. Co., 103 Chambers, N. Y., 7
D. E. Whitton Mach. Co., New London, Conn., 45
G. Clamps.
Woodruff, Miller & Co., Mt. Carmel, Ct., 16
H. Clock Springs, &c.
Dunbar Bros., Bristol, Conn., 6
I. Coal.
Borden & Lovell, 70 West, N. Y., 4
H. A. & Co., 111 Broadway, N. Y., 40
J. Cont and Hot Hoops.
Perkins & Bradley Mfg. Co., New Haven, Conn., 3
K. Coffee and Spice Mills.
Enterprise Mfg. Co., Philadelphia, Pa., 43
Lane Bros., Poughkeepsie, N. Y., 43
L. Coke.
Schoonmaker J. M., Pittsburgh, Pa., 43
M. Commission Merchants, Iron, Steel &c.
Howard, Childs & Co., Pittsburgh, Pa., 43
N. Copper.
New Haven Copper Co. 294 Pearl, N. Y., 2
O. Cordage.
Elizabethport Steam Cordage Co., 48 South, N. Y., 26
P. Corrugated Iron.
National Corrugating Co., Cincinnati, 14
Lacey Iron Bridge & Roof Co., 5 Day, N. Y., 4
Standard Iron Co., Bridgeport, Ohio, 40
Q. Coverings, Boiler and Pipe.
Chalmers-Spence Co., 419 Eighth, N. Y., 9
R. Frames.
Savage Wm. & Co., Philadelphia, Pa., 47
S. "Rip-rip" Awls.
Millers Falls Co., 74 Chambers, N. Y., 48
T. Tarry Combs.
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U. Cutlery, Importers of.
Clayworthy F. & W., 82 Chambers, N. Y., 10
V. Cutlery, Manufacturers of.
Goodell Co., Antrim, N. H., 42
W. Jamblers.
Shepard Hardware Co., Buffalo, N. Y., 45
X. Discount Books.
Williams David, 65 and 68 Duane, N. Y., 37
Y. Dog Muzzles.
Iron hardware Co., Torrington, Conn., 35
Z. Door Fasteners.
H. A. & Co., Philadelphia, 32
A. Door Hangers, House and Barn.
Lane Bros., Poughkeepsie, N. Y., 43
Stearns E. C. & Co., Syracuse, N. Y., 20
Terry City Co., Horseheads, N. Y., 20
B. Door Knobs.
Boston Knob Co., Boston, Mass., 26
C. Door Springs.
Colled Wire Belting Co., 93 Cliff, N. Y., 48
D. Drilling Machines.
Way & Russell Mfg. Co., Greenfield, Mass., 48
University Drill Co., Cincinnati, 48
E. Forge Forgings.
Becher & Peck, New Haven, Conn., 40
Derrell Bros., 26 First, Brooklyn, D. C., 44
Philadelphia Drop Forge Co., Phila., Pa., 43
Wyndham & Co., Worcester, Mass., 43
F. Presses.
Becher & Peck, New Haven, Conn., 40
Stiles & Parker Press Co., Middletown, Conn., 43
C. O. Waterbury, Conn., 44
G. Hooks, Cotton & Bale.
New York Handle & Mallet Works, 465 E. Houston, N. Y., 43
H. Horse Nails, Makers of.
Champion Horse Nail Co., Appleton, Wis., 43
National Horse Nail Co., Vergennes Vt., 43
I. Horse Shoes, Makers of.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y., 43
Shoemaker & Sons, Troy, N. Y., 43
The Burden Iron Co., Troy, N. Y., 43
J. Hot-Blast Stoves.
Hot-Blast Stove, Pittsburgh, Pa., 43
K. Hydrants, &c.
McLean John, 296 & 298 Monroe, N. Y., 40
L. Hydraulic Jacks.
McCoy & Sanders, 28 Warren, N. Y., 44
Watson & Stillman, No. 43d, N. Y., 47
M. Hydraulic Nuts.
Amherst Hydraulic Motor Co., Holyoke, Mass., 43
N. Ice Cutting Machines.
Whitney F. E. & Co., Boston, Mass., 32
O. Indurated Fibre Ware.
Indurated Fibre Co., Lockport, N. Y., 6
P. Insurance, Boiler.
 Hartford Steam Boiler Inspection & Insurance Co., N. Y., 43
Q. Iron, Manufacturers of.
C. O. Justice Jr. & Co., 331 Walnut, Phila., 5
Hicks & Dickey, Philadelphia, Pa., 43
Hoffman J. W. & Co., 208 S. 4th, Phila., 5
Hoffman J. W. & Co., 208 S. 4th, Phila., 5
R. Iron, Manufacturers of.
Alad Wood Co., Philadelphia, 5
Barlow Iron Co., Troy, N. Y., 43
Brookland Iron Co., Philadelphia, 5
Moorhead & Co., Pittsburgh, Pa., 43
Montour Iron & Steel Co., Danville, Va., 40
Plymouth Rolling Mill Co., Conn., 43
Rockwell, N. Y., 43
Potterville Iron Works, Wheeling, W. Va., 43
The Pascale Rolling Mill Co., Paterson, N. J., 43
The Wilcox & Co., Bridgeport, Conn., 43
Troy Steel and Iron Co., Bridgeport, Conn., 43
Whitney A. R. & Co., 38 Hudson, N. Y., 43
S. Iron and Steel, Sweden.
Lundberg Gustaf, Boston, Mass., 43
Page, Newell & Co., Boston, Mass., 43
T. Iron Brokers.
Fox John, 180 Broadway, N. Y., 43
Walworth W. H., Philadelphia, Pa., 43
Iron & Steel, Philadelphia, Pa., 43
Hart Wm. K. & Co., Philadelphia, Pa., 43
John L. Rosen, Philadelphia, Pa., 43
Landberg Gustaf, Boston, Mass., 43
Mohr J. J., 430 Walnut, Philadelphia, Pa., 43
Wier L. B. & Co., Philadelphia, Pa., 43
U. Iron Dealers.
Abe's Brothers, 190 South, N. Y., 43
Albert Jere & Co., N. Y., 43
Bonnell, Botoford & Co., Youngstown, 43
Borden & Lovell, 70 and 71 West, N. Y., 43
Conner Daniel, N. Y., 43
Cox Justice Jr. & Co., Philadelphia, 5
Eberick & Co., Philadelphia, 5
Hart Wm. K. & Co., Philadelphia, 5
Hirrod Chas. & Co., Chicago, Ill., 43
Hoffman J. W. & Co., 208 S. Fourth, Phila., 5
Hoffman J. W. & Co., 208 S. Fourth, Phila., 5
Keely Jerome & Co., Philadelphia, 5
Lindsey, Parvin & Co., Philadelphia, 5
Pittman James H. & Co., Phila., 5
Rundberg Gustaf, 38 Kilby, Boston, Mass., 43
Lundberg Chas. G., Boston, Mass., 43
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O'Brien & Wallace, N. Y., 43
Person & Co., 24 to 27 West, N. Y., 43
Pullman J. Wesley, Philadelphia, 5
Wallace Wm. K. & Co., Albany & Wash., 43
Wilson E. H. & Co., Philadelphia, Pa., 43
V. Iron Pig, Importers of.
Abbott Jere & Co. (Swedish), New York & Boston, 43
Williamson James & Co., 65 Wall, N. Y., 43
W. Iron Sheet, Manufacturers of.
Ingersoll & Co., Philadelphia, Pa., 43
Standard Iron Co., Bridgeport, Ohio, 40
W. D. Wood & Co., Limited, Pittsburgh, 43
X. Iron, Sheet, Manufacturers of.
Moore, Wheeler & Co., Cliff, N. Y., 43
Y. Ironwork, Ornamental.
Champion Iron Fence Co., Kenton, O., 35
Z. Keys.
National Key Works, Birmingham, Ct., 12
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Harrington E. & Son, Philadelphia, 43
Priddy F., 407 W. 40th, N. Y., 14-43
Wardlaw Mfg. Co., Cincinnati, 43
L. Lawn Mowers.
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Blair Mfg. Co., Springfield, Mass., 43
Blair Mfg. Co., Springfield, Mass., 43
Burke Wm. C., Coldwell Mfg. Co., Newburgh, N. Y., 43
N. Lloyd & Supply Hdw. Co., Phila., Pa., 33
Mass, Foot & Co., Springfield, O., 45
O. Lemon Drills.
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P. Levels.
Green, Tweed & Co., Pittsburg, Mass., 43
Sawyer & Co., F. Alford, Mass., 43
Q. Locks and Escapes, Manufacturers of.
Diets A. E., 97 Chambers, N. Y., 43
Ireland Mfg. Co., Cincinnati, O., 43
Steel & Edge Mfg. Co., Bridgeport, Conn., 43
Quackenbush Sons, 555 Eighth av., N. Y., 43
Vale & Towne Mfg. Co., Stamford, Conn., 13
R. Loositive Cylinder Horng Machine.
Pedrick & Ayer, Philadelphia, 43
S. Lubricators.
Cincinnati Brass Works, Cincinnati, O., 43
Detroit Lubricator Co., Detroit, Mich., 43
T. Machinery.
Adt Jones & Son, New Haven, Conn., 43
Garves W. F. & John, Rockford, Ill., 43
Hart Wm. K. & Co., 139 Centre, N. Y., 43
Harlington E. & Son, Philadelphia, 43
Hendy Machine Shop, Torrington, Conn., 43
Israel H. Johnson Jr. & Co., Phila., Pa., 47
Pyral F., 407 W. 40th, N. Y., 14 & 43
Roberts & Roberts, N. Y., 43
Sellers Wm. & Co., Philadelphia, 19 & 43
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Sawyer & Co., Foundry and Machine Co., Philadelphia, Pa., 43
Stokes & Parrish Machine Co., Phila., 46
U. Saw Plant, Stone, Lead, Zinc, etc.
Waterbury Barrel Foundry and Machine Co., Waterbury, Conn., 44
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Collins & Leighton, Syracuse, N. Y., 13
W. Macchines, Tools and Supplies.
Blaisdell F. & Co., Worcester, Mass., 43
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King J. & Co., Watford, N. Y., 43
Solters Wm. & Co., Pittsburgh, Pa., 43
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X. Maltese.
N. Y. Handle & Mallet Works, 450 E. Houston, N. Y., 43
Y. Measuring Faucets.
Lane Bros., Poughkeepsie, N. Y., 43
Z. Metals.
Dickerson Van Busen & Co., 39 and 31 West, N. Y., 43
Feeling Wm. S., 100 Chambers, N. Y., 11
Taylor & Co., 99 John, N. Y., 43
Phelps, Dodge & Co., Cliff st., N. Y., 2
A. Metallurgists.
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Britton J. Blodgett, 330 Walnut, Phila., 5
B. Mills, Bone Grinding.
Ayers & Easton, Pa., 43
C. Mine Lamps.
Hunt & Connel, Scanton, Pa., 35
Leonard Bros., Scanton, Pa., 35
D. Mitre Boxes.
Miller & Box Co., Millers Falls, Mass., 43
E. Molding Sand.
Paxson J. W. & Co., 614 Beach, Phila., 5
F. Mouse Traps.
Ayers & Easton, Unionville, Conn., 34
G. Nail Machinery.
P

The Question of Freights.

FREIGHT CLASSIFICATIONS.

As in England so in America, the railroads were not developed according to any far reaching plan, but, like Topsy, they "grewed." It was reserved for the executive genius of a later day to combine the small lines into systems, and, in turn, to bring these systems into harmony. Classifications which represented the different tolls which should be levied upon property as each small road might determine, differed from each other as we might expect men's opinions to differ upon any disputed question. As short roads were joined into continuous lines between strategic points, the new corporation would choose as its classification perhaps a combination of those existing on the earlier lines. This would govern its local or station to station business. As lines became systems and new questions of long distance traffic arose, the systems agreed upon through classifications, often leaving the local rates undisturbed. Following natural geographical lines, the systems formed associations in the territory thus served, each association having its own rules, classification and special conditions. The trunk lines comprise, generally speaking, the railways in the States from the seaboard to the Mississippi River and Lake Michigan, and from the Ohio to the Canada line; the Southern Railway and Steamship Association comprises the territory south of the Ohio and east of the Mississippi River; the different associations west of Chicago and St. Louis running down into Arizona and New Mexico and up to St. Paul and Minneapolis, since they use but one classification, the Joint Western, may for our purpose be considered as one. Formerly the traffic to and from the Pacific Coast had a special classification of its own; since April 1, however, it has been decided to use the Joint Western, or, as it is now known, "the Western Classification." Formerly, also, in the trunk-line territory were used three principal schedules—the East-bound, the West-bound and the Middle and Western States; now, however, these are combined into the classification known as the "New Official."

These are the general divisions, though, as noted in the cases of roads using one classification for through and another for local freight, some of the railways in the divisions named have not adopted the agreements of the roads around them. As illustration of this we may mention the Mobile and Ohio and the Illinois Central railroads, which have so far insisted upon using in the State of Mississippi a classification which is a bad arrangement of their own, to the hindrance of the freedom of trade to and from that territory. Other long lines like the Northern Pacific have used their own classification for their local traffic.

It will be seen that the tendency is strongly toward the use of a common classification by all the roads embraced in an association and which have a more or less common interest. Will this tendency continue until the whole country shall have but one uniform system for the classification of freight? There can be no question but that the easy flow of trade is checked between distant parts of our country by the application of a system of rates at some junction point different from those under which the property was shipped. Stability of rates and a knowledge of them which can be easily acquired by merchants are of great importance to the free interchange of products. This stability is in a great measure secured by the provisions of the Interstate law requiring publication without change; but without uniformity in the classification it must continue difficult for the trading public to arrive at through rates as quickly as our modern business methods demand. On the other hand, the adoption of a uniform schedule by the Railway Clearing House in England is not a criterion for us. Our territory is large, our distances from points of supply to consumption often great, and our soil, climate and conditions naturally diverse, all make it difficult, if not impossible, that any agreement can be reached by which all our different productions can be everywhere treated alike. The tropical productions of California compete in the Eastern market with the fruits from the Mediterranean. The former must be carried to our markets at rates which will enable them to be sold here, since the price which can be obtained is fixed by foreign competition. The conditions between this long-distance traffic, and the same when carried for short distances on the Pacific Coast for home consumption, are so different that to apply the same rule to both would be a manifest injustice. Again, it often entirely alters the case whether the property is moved from West to East or from East to West. Take, for example, agricultural implements: The manufacturer in New England or New York may buy some of his supplies of wood and iron from Western markets; in turn his manufactured product must find a market in the West in competition with factories on the spot who are not subject to these transportation expenses, for it should not be forgotten that it is the great West to which manufacturers must look for future sales. To put the machines of the Western factory when shipped Eastward, and the machines of New England when shipped Westward, upon the same basis as to classification and rate, while, apparently fair, would in reality be most unjust and unwise. Within reasonable limits it is best for both carriers and public to foster the widest competition of markets. Our civilization may indeed be defined commercially as a full interchange of product. It is easy to say that the New England factory should move West, but if this idea were fully carried out we should take steps backward toward the time when each community raised its own food, and made its own clothes and implements.

Is there, then, no prospect for uniformity in our classifications? A suggestion of importance comes from our transcontinental systems. While adhering to the Western classification generally, they have adopted a special commodity tariff in which the Pacific specialties are given rates which will enable them to be sold in distant markets. If the associations we have mentioned should agree upon some general schedule, would it not be possible to secure a general

uniformity, while at the same time, by exceptional lists, to grant their special products such privileges as in equity they should have.

ALL WATER AND RAIL AND WATER RIVALRY.

The rivalry between all water and rail and water transportation interests grows sharper every day in the effort to control the bulk of the spring business. The following table gives the present tariff on water and rail and water lines from New York to a few of the principal Western points:

To—	Water.				
	1	2	3	4	5
Chicago	35	36	25	20	18
Cleveland	35	36	25	18	17
Port Huron	35	36	25	18	17
Duluth	56	48	38	28	25
St. Paul	71	56	45	35	30
Minneapolis	90	75	57	42	38

The all-rail transportation companies declare that their freighting interests are in no way jeopardized, either by the working of the commerce law or the unusual activity among the water transportation lines, and that it will require but a few weeks to whip into line the small short haul companies that now refuse to co-operate on fair terms, and to establish a uniform and just tariff rate satisfactory to every interest involved.

The Consolidation of Vermilion Lake Ore Interests.

This year has witnessed some very large financial operations in the transfer of Lake Superior iron ore properties, but the greatest of all was consummated on the 3d inst., when the control of the Minnesota Iron Company and the Duluth and Iron Range Railroad Company was purchased by a syndicate of Chicago and New York capitalists, headed by Mr. H. H. Porter, of Chicago. The terms of the sale have not been made public, but it is understood that the consideration was not less than \$7,500,000 cash. The Minnesota Iron Company owns the famous Vermilion Lake iron ore mines, and the capitalists interested in it built in 1882 the railroad referred to for the purpose of conveying ore from the mines to Two Harbors, the nearest shipping point on Lake Superior, 63 miles distant. The road has since been extended to Duluth to connect with the railroad system of the country, and now comprises a total length of about 100 miles. It includes, also, a land grant of about 600 square miles, six sections per mile. It is understood that Mr. Charles Magnus Tower, Jr., under whose management this magnificent property has been developed, will retain the position of president.

Mr. Porter and his associates, among whom are Mr. Jay C. Morse, of Chicago, and Mr. H. H. Rogers, of New York, had secured control of new iron-ore deposits discovered in the vicinity of the Vermilion Lake mines, and it was their purpose to build a railroad to Lake Superior in case they were unable to make terms with the Minnesota Iron Company, but having now effected a consolidation of all interests in that section, an outlay for this purpose will not be needed. The development of the new ore fields will also be pushed more rapidly, with but a short line of railroad to be built to the Duluth and Iron Range Railroad for shipping the product. So far as known the iron-ore property now controlled by Mr. Porter and his associates is the largest and the most valuable in the world. The profit for 1887 on a product of 400,000 tons is estimated at \$800,000. It is understood that, notwithstanding the affiliations of the owners with some of the principal steel works of the country, the property will be managed independently and the ore will be sold in the open market as heretofore.

The Age of Steel reports that experiments of great interest and importance have been made at Higginsville, Mo., to decide whether Missouri coal will coke. Experiments to test this matter have been made at various points in the State, but owing to the large amount of sulphur in the coke produced it did not stand the further tests and proved worthless. The Excelsior Coal Company, of Higginsville, have made several experiments during the past few weeks, and upon April 5 completed the burning of a third oven. These experiments have produced the most satisfactory results, the coke obtained comparing favorably with Pennsylvania coke.

A wide-awake Chicago agent for an extensive sheet-iron mill has an excellent scheme in connection with the manufacture of sheet iron which he thinks might be put into effect with great advantage to sheet-iron manufacturers. He says that in the course of the next month or two the manufacturers of sheet iron will all take large orders for delivery during the coming season, and if the experience of the past is any guide they will so tie themselves up that they will practically be out of the market for months to come. In that event it will be very difficult for consumers who have not made contracts to secure such supplies as they may need from time to time. Now he says it would be very much to the advantage of sheet-iron manufacturers if they would endeavor to have stocks of sheet iron on hand in such quantities that they would be able to supply an occasional demand. This would have been an expensive procedure years ago, but could now be carried into effect with a more reasonable outlay of capital. In the natural gas districts, for instance, it would be an easy matter to erect a warehouse which would have a cemented floor and be heated with natural gas to an even temperature at all times, thus guarding against dampness or other causes of deterioration in the sheet iron. Manufacturers who would provide themselves with stocks in this way would be

able to supply a demand which has heretofore arisen when they are least able to take advantage of an opportunity to secure better prices than those at which they are forced to take long-time contracts. The prompt shipments that could be made under such circumstances would also help them very much in securing a regular class of customers. There are many other advantages in this scheme which would seem to make it attractive to sheet-iron manufacturers, and it is somewhat singular that it has not yet been carried into effect by some of our most enterprising establishments.

Masterless Men-of-War.

In a recent lecture on this subject at the Royal United Service Institution, in London, England, by Captain Fitzgerald, R. N., the lecturer said that, though he was of opinion that it would be advisable to unrig immediately all the present ironclads, yet he considered that the carrying out of this idea would be more applicable to future designs for cruisers than to the unrigging of the present single-screw corvettes. He maintained that there was no economy in having masts and sails, as these were out rightly and did not save coal, as they stopped the ship more in foul winds than they assisted her in fair. He pressed that the present rigged ironclads would be more powerful fighting machines without their spars and rigging than with them, leaving in their lower masts and turning the tops into small machine gun batteries. The principal arguments for the abolition of spars and sails in men-of-war, but more particularly in ironclads, were that the weight of masts and sails caused increased immersion and occupied valuable space both on deck and below-space which might otherwise be devoted to warlike stores. They masked, more or less, the fire of guns. There was a probability of wreckage from them fouling the screw in action, and lastly, though perhaps the strongest argument of all, was the fact that the retention of masts and sails in men-of-war diverted so much of the attention, the energy and the resources of both officers and men from the real work of their profession, and from the study of modern naval warfare, and occupied them in drills and exercises as obsolete for fighting purposes as the bow and arrow drill of the Saxons. It was said that a ship's company which was smart at drill aloft was sure to be smart in every thing else. This might be true in some cases, but even if it were so it did not furnish any sufficient argument for keeping up sail drill. The lecturer discussed at length the objections which would be made to the principles he enunciated, and he claimed that whatever risks there might be in his proposals, these risks were such as occurred even in the carrying of gunpowder, and the necessity of change must be recognized. The duty now before the country was not to build ships to suit the seamen, but to train the seamen to suit ships in which were the useful inventions of modern time and the innovations of modern science.

Electrical Conductivity of Metals.

The most reliable tests of electric conductivity of the metals are those lately made by Mr. L. Weiller. They were conducted with a series of bars specially prepared for the purpose. The measurements were taken by means of a Wheatstone bridge with a sliding index, a differential galvanometer, and a battery of four cells. The results are given in the following table, the comparison being based on the conductivity of silver, which is taken as 100:

Names of Metals.	Conductivity.
Silver, pure	100
Copper, pure	96
Copper, pure, super-refined and crystallized	99.9
Silicon bronze, telegraphic	98
Copper and silver alloy at 50%	86.65
Gold, pure	78
Silicon copper, 35 of silicon	75
Silicon copper, 12 of silicon	54.7
Aluminum, pure	54.2
Tin, with 10% of sodium	46.9
Silicon bronze, telephonic	35
Pumbliferous copper, with 10% of lead	30
Zinc, pure	29.9
Phosphor-bronze	29
Silicon brass, with 25 of zinc	29.49
Brass, with 35 of zinc	21.15
Phosphor-tin	17.7
Gold and silver, 50% each	16.12
Swedish iron	16
Banca tin, pure	15.45
Antimony copper	12.7
Aluminum bronze, 10% Al	12.5
Cadmium amalgam, 13% Cd	12.2
Siemens steel	12
Mercurial bronze	10.14
Platinum, pure	10.6
Armenical copper, 10% arsenic	9.1
Lead, pure	8.88
Bronze, with 20% of tin	8.4
Nickel, pure	7.89
Phosphor-bronze, 10% tin	6.5
Phosphor-copper, 35 phosphorus	4.9
Antimony	3.88

Water Rams in Steam-Pipes.

Mr. Charles E. Emery, chief engineer of the New York Steam Company, in one of his recent lectures on "The Transmission of Steam," refers in an interesting manner to water rams in steam pipes. In the April number of the *Sterns Indicator* Mr. Emery is quoted as follows:

The principal cause of accidents in the operation of large, long steam pipes arises from the presence of water. If steam be admitted at the top of a vessel partially filled with cold water, condensation will take place until the surface is somewhat heated, and this, in connection with a cloud which forms above the surface, will retard rapid condensation, so that in due time the full steam pressure can be maintained above water cold at the bottom. This phenomenon is not an infrequent occurrence in boilers in which the circulation is defective. It is, therefore, perfectly safe to heat up any vessel containing cold water, if the steam can be admitted from the top upon the surface of the water and so maintained. If, however, steam be blown in below the surface of the water, a bubble will be formed, which will increase in size until its surface becomes sufficiently expanded to condense the steam more rapidly than it can enter, when a partial vacuum will be created, the bubble will collapse, and the water flowing in from all sides at high velocity will meet with a blow, forming

what is called a water ram. In blowing into a large vessel, these explosions occur in the middle of the mass, and create simply a series of sharp noises. If, however, steam be blown into a large inclined pipe full of water, it will rise by difference of gravity to the top of the pipe, forming a bubble as previously stated; and when condensation takes place, the water below the bubble will rush up to fill the vacuum, giving a blow directly against the side of the pipe. As the water still further recedes, the bubble will get larger, and move further and further up the pipe, the blow each time increasing in intensity, for the reason that the steam has passed a larger mass of water, which is forced forward by the incoming steam to fill the vacuum.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending May 10, 1887:

Hardware.	Steel.
Baker, Hermann & Co.	Abbott, Jere, & Co.
Morse, es.	Wire coils, 31,011
Arms, es.	Baring Bros. & Co.
Curley & Bro.	Billes, 7550
Cutlery, case, 1	Slabs, 10,749
Dunn John.	Reas. Slabs, 2562
Mach'y, es.	Slabs, pes., 1550
Field, Alfred & Co.	Billes, pes., 1391
Cutlery, es., 15	Baker, Carl F.
Morse, es., 75	Morse, es., 1
Folsom, H. & D.	Downing, R. F. & Co.
Arms, es., 10	Bils., 235
Fraser, P. A. & Co.	Plates, pes., 444
Morse, case, 1	Germania Bank of Lon-
Kasner, A.	don.
Cutlery, es., 6	Oil Barrel Hoop
Packages, 3	6300
Lau, J. H. & Co.	Heyn, Alfred.
Arms, es., 2	Rds. bils., 4316
Lewis & Conger,	Lalanc & Grosjean.
Casks, 4	Sheets, bils., 119
Case 1	Mercantile Deshp Co.
Mohr, Jose S.	Bils., 30
Mach'y, case, 1	Bars, 8
Montgomery & Co.	Cases, 1
Casks, 4	Moore, J. B. & Co.
Newton & Shipman.	Newton & Shipman.
Files, es., 4	Files, es., 4
Rigny, A.	Corking machine, 1
Corking machine, 1	Sack & Richmond.
Sack & Richmond.	Nails, es., 2
Nails, es., 2	New & Shipman.
Shattuck & Binger.	Bundles, 152
Packages, 2	Bars, 21
Wiesch & Hilger.	Cases, 4
Chains, es., 37	orrigins, 40
Morse, es., 10	Pilchitt, F. S.
Arms, es., 14	Morse, es., 173
Witte, John G. & Bro.	Wagner, W. F.
Morse, case, 1	Packages, 169
Order.	Bundles, 135
Mach'y, es., 5	Bars, 74
Old rails, 100	Cases, 48
Cutlery, case, 1	Plates, 168
	Webb, J. B.
	Roller flutes, 4
	Order.
	Hands, 373
	Bars, 46
	Case, 1
	Forgings, 6
	Skips, 9
	Rollers, 6
	Rails, 1500
	Rods, bils., 2279
	Forgings, es., 18
	Plates, 125
	Old spring, tons, 400
	Billes, Slabs, 400.
	600
	Rods, pkgs., 14,966
	Packages, 236
	Crop ends, tons, 195
	Order.
	Metals.
	Brown & Tauso.
	Zinc Plates, 300
	Bruce & Cook.
	Tin plates, bxs., 754
	Tin plates, bxs.,
	3100
	Byrne, J. S. & Son.
	Tin plates, bxs., 300
	Drexel, Morgan & Co.
	Tin plates, oxs., 5039
	Drexel & Co.
	Tin plates, bxs., 817
	Gould, R. S.
	Brass foundry es., 10
	Lazard, R. S.
	Tin plates, bxs., 938
	Mersack, C. S. & Co.
	Terne pils., bxs., 220
	Phelps & Co.
	Tin plates bxs., 14,000
	Black taggers, bxs.,
	168
	Order.
	Tin plates, bxs., 20,228
	Antimony, es., 59
	Tin and Terne
	plates, bxs., 807
	Terne plates, bxs, 886
	Nickel, pkgs., 15
	Tin slabs, 300

The imports of Cutlery, Hardware, and Metals at this port during the week ending May 6 were as follows:

Quantity.	Value.
Anvils	57 \$800
Antimony ore	15 1,000
Brass goods	92 5
Bismuth	1 365
Bronzes	14 1,086
Chains and anchors	31 1,851
Copper	29 1,935
Cutlery	35 13,473
Dutch metal	28 3,911
Guns	42 4,354
Hardware	12 1,078
Iron hoops, 1000	22 690
Iron, pig, tons	4,629 70,327
Iron, sheet, tons	26 2,022
Iron, spiegel, tons	3,638 83,148
Iron ore, tons	791 1,432
Iron tubes	8 88
Iron, other, tons	7,015 120,850
Machinery	54 6,073
Metal goods	475 22,660
Nails	1 3
Needles	12 4,273
Old metal	2 2,776
Platina	2 24,067
Steel	68,882 96,263
Tin, bils.	45,712 174,227
Tin, slabs, 3,621 lb.	358,139 56,947
Wire	428 2,768
Zinc, lb.	569 51
Zinc, oxide	350 2,760

Mr. W. H. Sills, 118 Lake street, Chicago, has been appointed agent for the sale of the Acme elbow, with the exclusive control of sales in Chicago and St. Louis. This elbow is manufactured by the Acme Elbow Company, of Milwaukee, Wis., and is made of one piece of iron bent into the proper shape. Mr. Sills has also made arrangements to carry in stock a full line of the stamped and pieced tinware manufactured by Messrs. Matthai, Ingram & Co., of Baltimore, Md., selling exclusively to jobbers and not to the retail trade.

Gerhard Krus has determined the atomic weight of gold by the analysis of neutral trichloride and of potassium gold bromide; for a mean value he has found 196.66, the maximum of five methods being 196.741, while the minimum was 196.619. He regards 196.64 as the atomic weight most probably correct.

Exports.

The following table presents the exports of Hardware, Iron, Steel, Metals, &c., from the port of New York, for the week ending May 10, 1887:

Dutch West Indies.			Havre.		
Hdw., pkgs.	Quant.	Val.	Cop. plates.	Quant.	Val.
Mf. iron, pkgs.	1	4	Pumps, pkgs.	5	409
Clocks, es.	1	2	Copper, es.	91	12,125
Wash. mach.	1	7	Mach'y, pkgs.	47	19,185
Twine, es.	1	17	Copper, bars	5	121
			Hdw., es.	53	825
Dutch East Indies.			Bordeaux.		
Pumps, pkgs.	1	15	Ag imp, pkgs.	10	221
Clocks, es.	42	462	Nails, pkgs.	5	15
			Mach'y, pkgs.	1	105
Stettin.			Venetia.		
Ag imp, pkgs.	39	2,749	Cutlery, es.	10	259
			Hdw., pkgs.	41	380
Staranger.			Brazil.		
Mach'y, pkgs.	2	450	Ag imp, pkgs.	29	461
			Tacks, es.	35	156
Hamburg.			Cienfuegos.		
Mf. iron, pkgs.	1	150	Cutlery, es.	13	294
Metal goods,	1	3	Pumps, pkgs.	3	1,151
es.	7	213	Cartridges, es.	26	356
Hdw., pkgs.	234	1,633	Wash. mach.	3	412
Pumps, pkgs.	4	141	Nails, pkgs.	110	389
Ag imp, pkgs.	214	3,815	Agate-wares	29	824
Clocks, pkgs.	33	2,209	Stomach.	1	24,278
Mach'y, pkgs.	24	2,332	Guns, es.	1	162
Saw, ma., es.	252	4,307	Mach'y, pkgs.	109	6,871
Copper matte,	241	13,425	Clocks, pkgs.	42	1,116
			Mf. iron, pkgs.	129	1,335
Bremen.			Stuttgart.		
Mf. iron, pkgs.	2	24	Mf. iron, pkgs.	21	2,407
Mach'y, pkgs.	2	73			
Pumps, pkgs.	3	70	Leipsic.		
Hdw., es.	2	18	Printing prs.	6	750
Saw, ma., es.	3	201			
Copenhagen.			Rotterdam.		
Mf. iron, pkgs.	9	134	Ag imp, pkgs.	6	210
Hdw., es.	9	134			
Stockholm.			Lisbon.		
Pumps, pkgs.	2	40	Guns, es.	9	945
Clocks, es.	16	411			
Amsterdam.			Hosfist.		
Pumps, pkgs.	10	315	Ag imp, pkgs.	11	101
Hdw., es.	27	416			
Mach'y, pkgs.	16	1,118	Moscow.		
Ag imp, pkgs.	5	324	Mach'y, pkgs.	2	275
Clocks, pkgs.	29	530			
Hdw., es.	14	441	Gottenburg.		
Arms, es.	1	47	Ag imp, pkgs.	9	324
London.			Copenhagen.		
Pumps, pkgs.	2	60	Mf. iron, pkgs.	1	150
Clocks, es.	16	411	Metal goods,	1	3
			es.	7	213
Hamburg.			Stettin.		
Ag imp, pkgs.	39	2,749	Ag imp, pkgs.	39	2,749
Staranger.			Venetia.		
Mach'y, pkgs.	2	450	Cutlery, es.	10	259
			Hdw., pkgs.	41	380
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Mf. iron, pkgs.	2	24	Ag imp, pkgs.	10	221
Mach'y, pkgs.	2	73	Nails, pkgs.	5	15
Pumps, pkgs.	3	70	Mach'y, pkgs.	1	105
Hdw., es.	2	18			
Saw, ma., es.	3	201	Venetia.		
Copenhagen.			Brazil.		
Mf. iron, pkgs.	9	134	Ag imp, pkgs.	29	461
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Ag imp, pkgs.	5	324	Stomach.	1	24,278
Clocks, pkgs.	29	530	Guns, es.	1	162
Hdw., es.	14	441	Mach'y, pkgs.	109	6,871
Arms, es.	1	47	Clocks, pkgs.	42	1,116
London.			Mf. iron, pkgs.	129	1,335
Pumps, pkgs.	2	60			
Clocks, es.	16	411	Stuttgart.		
			Mf. iron, pkgs.	21	2,407
Hamburg.					
Ag imp, pkgs.	39	2,749	Leipsic.		
			Printing prs.	6	750
Staranger.					
Mach'y, pkgs.	2	450	Rotterdam.		
			Ag imp, pkgs.	6	210
Hamburg.					
Mf. iron, pkgs.	1	150	Lisbon.		
Metal goods,	1	3	Guns, es.	9	945
es.	7	213			
Hdw., pkgs.	234	1,633	Hosfist.		
Pumps, pkgs.	4	141	Ag imp, pkgs.	11	101
Ag imp, pkgs.	214	3,815			
Clocks, pkgs.	33	2,209	Moscow.		
Mach'y, pkgs.	24	2,332	Mach'y, pkgs.	2	275
Saw, ma., es.	252	4,307			
Copper matte,	241	13,425	Gottenburg.		
			Ag imp, pkgs.	9	324
Bremen.					
Mf. iron, pkgs.	2	24	Copenhagen.		
Mach'y, pkgs.	2	73	Mf. iron, pkgs.	1	150
Pumps, pkgs.	3	70	Metal goods,	1	3
Hdw., es.	2	18	es.	7	213
Saw, ma., es.	3	201	Hdw., pkgs.	234	1,633
Copenhagen.			Pumps, pkgs.	4	141
Mf. iron, pkgs.	9	134	Ag imp, pkgs.	214	3,815
Hdw., es.	9	134	Clocks, pkgs.	33	2,209
Stockholm.			Mach'y, pkgs.	24	2,332
Pumps, pkgs.	2	40	Saw, ma., es.	252	4,307
Clocks, es.	16	411	Copper matte,	241	13,425
Amsterdam.			Bordeaux.		
Pumps, pkgs.	10	315	Ag imp, pkgs.	10	221
Hdw., es.	27	416	Nails, pkgs.	5	15
Mach'y, pkgs.	16	1,118	Mach'y, pkgs.	1	105
Ag imp, pkgs.	5	324			
Clocks, pkgs.	29	530	Venetia.		
Hdw., es.	14	441	Brazil.		
Arms, es.	1	47	Ag imp, pkgs.	29	461
London.			Tacks, es.	35	156
Pumps, pkgs.	2	60	Cutlery, es.	13	294
Clocks, es.	16	411	Pumps, pkgs.	3	1,151
			Cartridges, es.	26	356
Hamburg.			Wash. mach.		
Ag imp, pkgs.	39	2,749	3	412	
			Nails, pkgs.	110	389
Staranger.			Agate-wares	29	824
Mach'y, pkgs.	2	450	Stomach.	1	24,278
			Guns, es.	1	162
Hamburg.			Mach'y, pkgs.	109	6,871
Mf. iron, pkgs.	1	150	Clocks, pkgs.	42	1,116
Metal goods,	1	3	Mf. iron, pkgs.	129	1,335
es.	7	213			
Hdw., pkgs.	234	1,633	Stuttgart.		
Pumps, pkgs.	4	141	Mf. iron, pkgs.	21	2,407
Ag imp, pkgs.	214	3,815			
Clocks, pkgs.	33	2,209	Leipsic.		
Mach'y, pkgs.	24	2,332	Printing prs.	6	750
Saw, ma., es.	252	4,307			
Copper matte,	241	13,425	Rotterdam.		
			Ag imp, pkgs.	6	210
Bremen.					
Mf. iron, pkgs.	2	24	Lisbon.		
Mach'y, pkgs.	2	73	Guns, es.	9	945
Pumps, pkgs.	3	70			
Hdw., es.	2	18	Hosfist.		
Saw, ma., es.	3	201	Ag imp, pkgs.	11	101
Copenhagen.					
Mf. iron, pkgs.	9	134	Moscow.		
Hdw., es.	9	134	Mach'y, pkgs.	2	275
Stockholm.					
Pumps, pkgs.	2	40	Gottenburg.		
Clocks, es.	16	411	Ag imp, pkgs.	9	324
Amsterdam.			Copenhagen.		
Pumps, pkgs.	10	315	Mf. iron, pkgs.	1	150
Hdw., es.	27	416	Metal goods,	1	3
Mach'y, pkgs.	16	1,118	es.	7	213
Ag imp, pkgs.	5	324	Hdw., pkgs.	234	1,633
Clocks, pkgs.	29	530	Pumps, pkgs.	4	141
Hdw., es.	14	441	Ag imp, pkgs.	214	3,815
Arms, es.	1	47	Clocks, pkgs.	33	2,209
London.			Mach'y, pkgs.	24	2,332
Pumps, pkgs.	2	60	Saw, ma., es.	252	4,307
Clocks, es.	16	411	Copper matte,	241	13,425
Hamburg.			Bordeaux.		
Ag imp, pkgs.	39	2,749	Ag imp, pkgs.	10	221
			Nails, pkgs.	5	15
Staranger.			Mach'y, pkgs.	1	105
Mach'y, pkgs.	2	450			
			Venetia.		
Hamburg.			Brazil.		
Mf. iron, pkgs.	1	150	Ag imp, pkgs.	29	461
Metal goods,	1	3	Tacks, es.	35	156
es.	7	213	Cutlery, es.	13	294
Hdw., pkgs.	234	1,633	Pumps, pkgs.	3	1,151
Pumps, pkgs.	4	141	Cartridges, es.	26	356
Ag imp, pkgs.	214	3,815	Wash. mach.	3	412
Clocks, pkgs.	33	2,209	Nails, pkgs.	110	389
Mach'y, pkgs.	24	2,332	Agate-wares	29	824
Saw, ma., es.	252	4,307	Stomach.	1	24,278
Copper matte,	241	13,425	Guns, es.	1	162
			Mach'y, pkgs.	109	6,871
Bremen.			Clocks, pkgs.	42	1,116
Mf. iron, pkgs.	2	24	Mf. iron, pkgs.	129	1,335
Mach'y, pkgs.	2	73			
Pumps, pkgs.	3	70	Stuttgart.		
Hdw., es.	2	18	Mf. iron, pkgs.	21	2,407
Saw, ma., es.	3	201			
Copenhagen.			Leipsic.		
Mf. iron, pkgs.	9	134	Printing prs.	6	750
Hdw., es.	9	134			
Stockholm.			Rotterdam.		
Pumps, pkgs.	2	40	Ag imp, pkgs.	6	210
Clocks, es.	16	411			
			Lisbon.		
Amsterdam.			Guns, es.	9	945
Pumps, pkgs.	10	315			
Hdw., es.	27	416	Hosfist.		
Mach'y, pkgs.	16	1,118	Ag imp, pkgs.	11	101
Ag imp, pkgs.	5	324			
Clocks, pkgs.	29	530	Moscow.		
Hdw., es.	14	441	Mach'y, pkgs.	2	275
Arms, es.	1	47			
London.			Gottenburg.		
Pumps, pkgs.	2	60	Ag imp, pkgs.	9	324
Clocks, es.	16	411			
			Copenhagen.		
Hamburg.			Mf. iron, pkgs.	1	150
Ag imp, pkgs.	39	2,749	Metal goods,	1	3
			es.	7	213
Staranger.			Hdw., pkgs.	234	1,633
Mach'y, pkgs.	2	450	Pumps, pkgs.	4	141
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Mach'y, pkgs.	24	2,332			
Saw, ma., es.	252	4,307			
Copper matte,	241	13,425			
Bremen.			Bordeaux.		
Mf. iron, pkgs.	2	24	Ag imp, pkgs.	10	221
Mach'y, pkgs.	2	73	Nails, pkgs.	5	

L. COES'
GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester Mass.
ESTABLISHED IN 1839.




Patented July 6, 1886. Patented July 8, 1884.
Registered March 21, 1874.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.
Straight Bar, Extra LONG NUT FOR SCREW IN JAW

The Best Made and Strongest Wrench in the Market.
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Only Manufacturers of the Genuine
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ROCHESTER N. Y.
MANUFACTURERS' AGENTS FOR
CLIFF'S BOLSTER SPRING.



FINEST CRUCIBLE STEEL. **BEST MALLEABLE IRON.**

LARGE CAPACITY		SMALL CAPACITY	
1,000 pounds Capacity.....	\$4.75	2,000 pounds Capacity.....	\$6.00
1,500 " " " " " " " " " "	5.00	3,000 " " " " " " " " " "	7.00
		4,000 " " " " " " " " " "	8.00
		5,000 " " " " " " " " " "	9.00
		6,000 pounds Capacity.....	\$10.00
		7,000 " " " " " " " " " "	11.00
		8,000 " " " " " " " " " "	12.00



THE EMPIRE METAL SPIRIT LEVEL, WITH DOUBLE PLUMB.
Glasses are Immovable. No Parts to Work Loose. Glasses Perfectly Protected. Made Entirely from One Piece.




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The Most Durable, Simple in Construction and Cheapest Iron Level on the Market.
Manufactured by **GREENE, TWEED & CO.,** 83 Chambers St., New York.

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21, 23 & 25 ANN STREET, NEW YORK,
Manufacturers of
SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC, MECHANICAL & PNEUMATIC ANNUNCIATORS & BELLS:
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Port Chester, N. Y.,
MANUFACTURERS OF
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(CHAMP-RED AND TRIMMED)
SQUARE AND HEXAGON NUTS A SPECIALTY.


J. FRED. WILSON,
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Cold Punched, Square and Hexagon
NUTS
Washers, Chain Links, &c.
Die Making and Special Punching to Order.
23 Hermon St., Worcester, Mass.



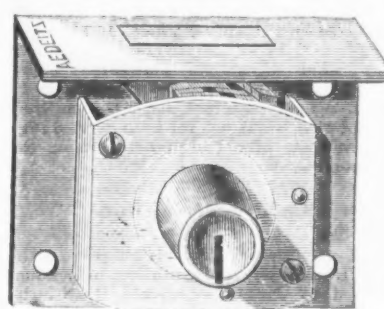

MOULTON'S
Improved Lemon Drill,
Patented June 28th, 1886.
Will extract the LAST DROP of juice from large and small lemons in five seconds.
Sent by mail on receipt of 15 cents; \$1 per doz. Cash with order. Agents wanted. Ask your jobbers for them. Address patentee and sole manufacturer,
W. F. MOULTON Burlington Vt.



ORE JIGS.
The attention of Hematite ore miners is called to our new Jig. The simplest and most effective separator now in use.
McLANAHAN & STONE,
Gaysport Foundry, Hollidaysburg, Pa.
Manufacturers of Ore Washers, Screens, Elevators, Conveyors, any general Ore Mining Machinery.



FLORENCE
OIL STOVES
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FOR SALE EVERYWHERE
MADE BY FLORENCE MACHINE CO.
FLORENCE, MASS.
New York Office: 27 UNION SQUARE.


A. E. DEITZ.


No. 51 Lock.

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W. & J. TIEBOUT,
MANUFACTURERS OF
BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.
Nos. 16 & 18 Chambers Street,
NEW YORK

ALWAYS GIVES THE
UTMOST SATISFACTION.
Main Belting Co.,
Manufacturers of
THE LEVIATHAN
COTTON
BELTING.
Unsurpassed for Strength, Durability and Cheapness.
Made to any length, Width and Strength
Main Driving Belts.
Guaranteed to Run Straight, Even Through out.
No Cross Joints, Unaffected by Damp. Clings well to the Pulley. Has no equal. In fact, is THE BELT.
MAIN BELTING COMPANY,
S. W. cor. Ninth and Reed Sts., Philadelphia.
Also
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THE CHAMPION LEVER
BLOWERS & FORGES
Are the Leaders of the World.

An entirely novel construction. "They have no equal." No Cog Wheels, Ratchets, Pawls, Gum Balls or other Friction Devices to wear out in a short time. Easy Motion, Powerful Blast, Noiseless and Durable. Guaranteed to give entire satisfaction. Write for catalogue and prices.



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Fully Warranted. Has Patent Adhesive Rolls, Best Steel Springs, Malleable Iron Crank.
Send for fully illustrated Catalogue and Price-List of thirty different styles and sizes of Wringers.

BAILEY WRINGING MACHINE CO.
WOONSOCKET, R. I.

Coxhead's Patent Combined Saw-Set and Vise
The only Tool in the market for Hand, Band, Scroll and Circular Saws.
JOHN F. COXHEAD,
POUGHKEEPSIE, N. Y.
Sold by
Quackenbush, Townsend & Co
85 Chambers St., N. Y.
Send or Circular.


MILLERS FALLS BORING MACHINE.

THIS Machine has been fully perfected in all its parts, and is now sold with full warrant that it will do better work and give better satisfaction than any other kind in use. The frame is made of half-inch round steel rods; the braces are the same and attach to the rods at the top by a set screw. When this set screw is loosened, the frame falls over so as to bore at any desired angle.



The depth of hole to be bored is fixed by a stop, as seen on the left hand upright rod in the cut. When the gate strikes this stop a latch is lifted and the machine throws itself into gear by the use of a spring, and the Auger is lifted out of the hole by continuing to turn the crank in the same direction.

When the Auger is drawn from the hole the frame hangs itself up until the machine is moved to the next hole, then it is dropped down by turning the crank back until the Auger strikes the wood, when it is thrown out of gear and proceeds to bore the next hole. As seen in the cut, the machine has adjustable cranks which fully regulate its speed and power.

PRICES:
Machine, without Augers, - \$7.50
Augers in sets, 13, 23, 41 quarters.
\$3.00, \$3.75, \$6.75.
Sizes of Augers (1, 1 1/2, 2) (1, 1 1/4, 1 1/2, 2) (1/2, 3/8, 1/4, 1/2, 1, 1 1/4, 1 1/2, 1 3/4, 2)

MILLERS FALLS CO.,
74 Chambers Street, New York.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
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SASH BALANCE
No Box Frames, No Weights, No Cords, No Pulleys.
Balances the sash perfectly, and runs as easily as weights.
Can be easily applied by any mechanic to
ANY WINDOW,
and is simple, durable, reliable and practical in every way.
SEND FOR CIRCULARS AND PRICES.
COLEMAN HARDWARE CO.,
SOLE MANUFACTURERS,
Formerly Ohio Butt Company,
55 Dearborn St., CHICAGO, ILL.
Please mention this paper.



Prices Lowest. **Quality Best.**
The accompanying cut represents our four-pointed, painted or galvanized
BARB FENCE WIRE,
MANUFACTURED BY
OHIO STEEL BARB FENCE CO.,
CLEVELAND, OHIO.
Cut of our two-pointed wire will appear next week.
CORRESPONDENCE SOLICITED



Hermann-Parker
Hardware Mfg. Co.,
MANUFACTURERS OF

GREY IRON SHELF HARDWARE.

Our Specialties: Axle Pulleys, Well Wheels, Grind-stone Fixtures, Hay-fork Pulleys, Wash-boiler Handles, Store Lifters and Post Mails.
Works: 11th and Papin and 12th and Gratiot Streets, St. Louis.
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WALPOLE MILLS
EMERY
SOUTH WALPOLE MASS.-CHUSETTS.



MANUFACTURING.

Iron and Steel.

Among the new iron enterprises that are being attracted to Findlay, Ohio, by its abundant supply of natural gas is the Findlay Iron and Steel Company, recently organized by Mr. W. H. Carruthers. Ground has already been broken for the buildings, and most of the machinery is on hand. The company will put up a first class forge train, and will begin with a 10 inch finishing guide train. The products will be horseshoe iron, small rods, squares, flats, ovals, bands, angles, small channels and other extra shapes, to be made from wrought scrap iron and steel ingots.

Graff, Bennett & Co., of Pittsburgh, will soon commence to build a new puddling department of about 30 furnaces in connection with their iron mill at Millvale.

The Union Steel Company, of Chicago, shut down their steel and rail mill on the 5th inst. Seven hundred and fifty men were locked out on the strength of a strike of 28 drillers, clippers and filers. The 28 men struck for some trivial cause, and the general shut down followed.

Furnace E, of Carnegie, Bros. & Co., at Braddock, Pa., was blown out last week on account of the coke strike. Should it continue, more of their furnaces will be blown out. The company have a large amount of metal on hand, and the rail mill will keep running, as usual.

The American Bridge Works, of Chicago, owned by the Chicago Forge and Bolt Company, were burned on the evening of the 2d inst. The works were situated at Fortieth street and Stewart avenue, and covered nearly 5 acres, comprising a machine shop, blacksmith shop, riveting shop, temple shop, point shed and foundry, all separate buildings. The loss will approximate \$100,000, partly covered by insurance. A large quantity of fine machinery was destroyed, and a number of partly completed bridges were injured, among them being 33 bridges for the new Chicago branch of the Atchison, Topeka and Santa Fe Railroad. These works were formerly known as the Boomer Bridge Works, and they were purchased in 1885 by the Chicago Forge and Bolt Company. The fire has occurred at a very unfortunate time for the owners, who have a large number of contracts for bridges, which they will now be obliged to transfer to other works, pending the rebuilding of their bridge department. The forge and bolt works of the company were not injured, and are still in active operation.

On the 6th inst., the entire establishment of the Beaver Falls Iron Company, at Beaver Falls, Pa., shut down on account of the management refusing to provide the sheet-rollers with a "doubler," according to the rules prescribed by the Amalgamated Association. The mills were running on three turns of eight hours each.

It is stated on good authority that the firm of Graff, Bennett & Co., of Pittsburgh, who some four years ago failed for about \$1,000,000, would within a short time liquidate the entire indebtedness. Ever since the failure the firm have been meeting their obligations as fast as they matured until now the liabilities amount to only \$600,000, two-thirds of which is held in and around Pittsburgh. This will be paid by the 20th prox., and Graff, Bennett & Co. will again stand in the commercial world perfectly solvent and free from all obligations.

At the plant of the Wheatland Rolling Mill Company, at Wheatland, Pa., which recently resumed operations after an idleness of some years, all the puddling furnaces, 13 double, equal to 26 single furnaces, and all the rest of the mill available, are in operation, making pipe iron. Several of the heating furnaces are being changed to puddling furnaces, and the rest of the mill is being changed as rapidly as possible to the same purpose. It is expected that the whole works will be in operation and making pipe iron by the 1st of July.

It is said that a number of furnaces in the Mahoning Valley, Ohio, will be compelled to bank up this week on account of the coke strike.

Hussey, Howe & Co., Limited, of Pittsburgh, closed down the greater portion of their works last week for the purpose of making general repairs.

Furnace No. 1, of the Missouri Furnace Company, at St. Louis, has been blown out, after a continuous service of two years and six months. The furnace will be relined and put in first class repair immediately. The Gordon-Whitwell stoves, just put in commission, work well, and Furnace No. 2 is turning out a larger amount of pig than ever before.

Struthers Furnace (Coke), in the Mahoning Valley, Ohio, was blown in on the 5th inst., after being thoroughly repaired.

The Pittsburgh Steel Casting Company, of Pittsburgh, closed down their works on the 7th inst., for the purpose of making repairs. The stoppage will last for about two months and throws 200 men out of employment.

Mr. M. V. Smith, metallurgical engineer, of Pittsburgh, has been awarded the contract for the four-hole soaking pit and artificial gas producers for the North Branch Steel Company, at Danville, Pa.

The Norton Iron Works, at Ashland, Ky., have just awarded a contract for the erection of a 200-ton steel plant.

The steel melters at the Black Diamond Steel Works, Pittsburgh, have been promised an increase of \$1 more on the ton for their work on and after the next pay day, May 15. The advance is entirely voluntary on the part of the firm and unsolicited by the men. The works are with great difficulty filling the long list of orders, as they are coming in with such rapidity.

On the 3d inst., a number of men were injured at the South Chicago Works of the North Chicago Rolling Mill Company, by the explosion of an ingot mold. The mold, it

appears, had not been swabbed entirely dry before it was used, and the molten steel caused a sudden conversion of the water into steam, which blew out the steel and threw it over the persons of the workmen standing near. Two men were burned very severely and probably fatally.

We take the following from an exchange: Messrs Julius Severin & Son have bought the "Old Mill," at Aurora, Ind., and intend to make sheet iron in it on a small scale.

It is said Newark (Ohio) capitalists are looking out for a location near Greensburg, Westmoreland County, Pa., on which to erect a large iron mill and boiler works, which are to employ over 200 hands.

The Glamorgan Works, of Lynchburg, Va., of which W. H. Wren is president, R. W. Crenshaw vice-president, and H. E. McWane is general manager, have purchased the patterns of the Lynchburg Iron Company. The company have the contract for the new furnace of the Lynchburg rail works, with the exception of the engine.

Machinery.

James F. Hotchkiss, maker of the well-known mechanical boiler cleaner, has removed to 120 Liberty street, New York. The seventeenth edition of his catalogue has just been issued.

The Lovell wire-nail machine, which seems to have attracted so much attention in England, is used in the works of the Albert Nail Company, in Monroe street, New York.

The Mellert Foundry and Machine Company, of Reading, Pa., have issued a new catalogue illustrating and describing their specialties. These embrace water and gas pipes, stop valves, fire hydrants, car and railroad castings, &c., and the Canada turbine.

The Hazelton Boiler Company, 716 to 720 East Thirteenth street, New York, are completing a brick shop, 40 x 100 feet, a little further down the street, as an addition to existing facilities. Excepting a couple of Betts radial drills bought for their own use, they have hitherto hired their boiler shop tools from the Quintard Iron Works. Now they have ordered a complete outfit of new boiler shop tools from Hilles & Jones, greatly increasing their facilities. The new tools are now being put in place in the new shop.

William Deering & Co., of Chicago, builders of harvesting machinery, have sent us two of their catalogues. They are fully illustrated, and describe in an interesting way some of their improved machines.

The Champion Blower and Forge Company, of Lancaster, Pa., are sending out a new illustrated catalogue. The company, we note, have added to the manufacturing of their Champion blower blowers and forges a full line of power blowers, exhaust fans, stationary forges, drill presses and tire benders.

Locomotive and machine shops are to be built at Marshall, Laredo, and San Antonio, Tex., to supply locomotives and machinery and railway appliances for the railroads in that State.

Messrs. Byram & Co., Detroit, Mich., are furnishing their "Colonia" Cupolas to the Schenectady Locomotive Works, Schenectady, N. Y.; Bement, Miles & Co., Philadelphia, Pa.; The J. Morton Poole Company, Wilmington, Del.; and the Jackson & Woodin Mfg. Company, Buswick, Pa.

The Abendroth & Root Mfg. Company, of New York, have just received a large order from the Southern Cotton Oil Company for their water tube boilers, about 4000 horsepower in the aggregate. These boilers will be erected for the oil factories at Houston, Texas; New Orleans, La.; Little Rock, Ark.; Atlanta, Ga.; Savannah, Ga.; Wilmington, N. C.; and Montgomery, Ala. This is among the largest orders for steam generators ever given at one time.

The Betts Machine Company, of Wilmington, Del., are just finishing a large planing machine for the Columbus Machine Company, of Columbus, Ohio. It will plane 6 feet square and 20 feet long, has two saddles on the crosshead, and a side tool on each upright, making four tools in all. Weight over 64,000 pounds.

The Korting Gas engine Company, Limited, have been organized under the laws of the State of New York to build the Korting gas engines. They are putting up a factory at Springfield, Ohio, where they expect to manufacture. Benj. H. Warder and A. S. Bushnell, of Springfield, Ohio, and John J. Glessner, of Chicago, are parties in interest. Geo. W. Silcox is president. The business office of the company will be located at 60 Barclay street, New York.

The Union Foundry and Machine Works, of Catasauqua, Pa., are rushed with an abundance of orders for the new plate mill, structural and general machine work. A large order for suburban stations on the New York Elevated Railway is being filled.

Kelly & Jones, of Pittsburgh, have been awarded the contract for the steam heating for the Ohio Soldiers' Home, to be erected near Sandusky, Ohio. The contract price is \$31,000.

The Mexican Iron Mountain Mfg. Company, of Durango, Mexico, have ordered from the Lewis Foundry and Machine Company, Limited, of Pittsburgh, an outfit of rolling mill machinery, including a 460 horse-power Porter-Hamilton engine.

Hardware.

The New Castle Plow Works, at New Castle, Pa., were sold at receivers' sale on the 4th inst. The purchasers were Rev. J. C. Smith, of Rose Point, Edward McMillan, Wm. Agnew and Jos. Beecher. The price paid was \$5300. The works were built less than two years ago at a cost of \$20,000, and were running steadily until internal dissensions caused them to be thrown into the hands of a receiver. The new owners will start the works at once.

D. H. Fitzgerald, who was the president of the Manhattan Hardware Company, is negotiating with Major McKnight for the lease of the Union Foundry, near the Schuylkill, in North Reading. The buildings will

be repaired and new machinery put in for the manufacture of hardware of a special character.—Reading, Pa. Times.

The Perkins & Bradley Mfg. Company, New Haven, Conn., have recently moved their plant into much larger quarters, and have largely increased their facilities for manufacture. They expect in the near future to bring out a much increased line of hooks and wire specialties.

The Southern Wire Company, St. Louis, Mo., are at present running 50 machines, making everything in the wire nail line manufactured by an ordinary manufacturer. They are also making a line of twisted flat steel ribbon fencing, which is furnished both galvanized and painted.

Miscellaneous.

The Murray Iron Works Company, Burlington, Iowa, inform the trade that their foundry only was burned, and that they are rebuilding as rapidly as possible and expect to fill orders for castings in about a week. The other departments are running as usual, and the loss is fortunately not so great as was supposed.

Everson, Sherwood & Barker, Limited, proprietors of the New Brighton Pottery Works, at New Brighton, Pa., inform us that the report that they were about to remove to Steubenville, Ohio, is without foundation. The formation of a sewer-pipe works at the former place, in which the above firm are interested, probably gave rise to the rumor.

The Industrial World, Chicago, says: "A company have been organized to operate mineral lands in Canada, with their headquarters in this city. It is composed wholly of Chicago parties, and has taken the name of Troy Lake Mining Company, with an office at No. 175 LaSalle street. The company's property is located about 30 miles above Kingston, Ontario, on the Rideau Canal, and consists at present of 200 acres of land, with mining leases on about 8.0 more acres. The company have just commenced opening up the property, and expect by the 1st of July to enter the lists as shippers of ore. Their analyses, it is claimed, made by the Union Steel Company, of Chicago, show a larger per cent. of metallic iron than has heretofore been assayed in this country, so far as is known, assaying from 67.79 to 70.21 pure metallic iron."

The Pittsburgh pool on iron ore, including all the railroads centering in that city, has dissolved, and there will be no further distribution of ore freight among the different roads, leaving each to secure its own business. There is no prospect of a war over the ore shipments, but, of course, every road will try to secure a good share of business.

It is reported that the largest gas well in the world has just been discovered at Fairmount, near Muncie, Ind. The test of Professor Orton, State Geologist of Ohio, shows that it is flowing nearly 12,000,000 feet per day.

The annual reunion of the Amalgamated Association will be held at Alliquippa, about 28 miles from Pittsburgh, on the 11th prox.

The stockholders of the Wheeling Natural Gas Company met at Wheeling last week, and elected the following board of directors: William Flinn, J. M. Guffey, John N. Neeb, C. L. Magee, C. B. McLean, John H. Hobbs, R. C. Elliott, C. W. Brockmeier, T. H. Given and W. T. Graham. The company have 99½ miles of pipe laid, and the monthly income is \$16,000. The debt of the company is only \$70,000, and a dividend of ¼ of 1 per cent. is being paid monthly.

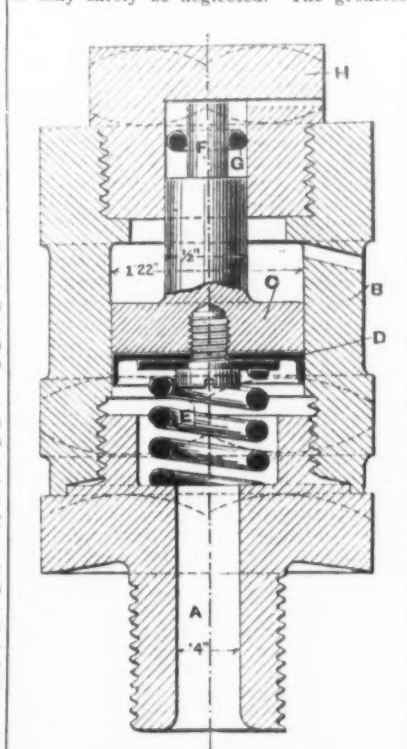
Crusher Gauges for Hydraulic Gun Carriages.

From a recent issue of *Industries*, London, we reproduce the annexed engraving, illustrating a gauge which has been used for several years to measure the greatest intensity of pressure produced in the hydraulic cylinders of large gun carriages, by the recoil of the gun on being fired.

These compressor cylinders, says our contemporary, are fixed to and form part of the carriage, the rams are attached to the gun, and the object of the arrangement is to absorb and control the recoil of the gun. This is found to be very nearly constant, even with wide variations in the charge of powder, and experiments with a 6-inch gun, the powder charge varying from 20 to 35 pounds, showed that the difference was only 1.7 inch in a total recoil of 34 inches; and with charges from 25 to 35 pounds of powder, a difference of only 6 inches in a total recoil of 20 inches. By making the cylinders of adequate strength, the recoil of any gun can be controlled as desired; it is, therefore, necessary to know the exact hydraulic pressure in the cylinders when designing other recoil presses, and it is for this purpose that the crusher gauge was made. The water from the cylinders during recoil is discharged through a regulating valve into a long tank, or into large exhaust pipes. The ordinary Bourdon gauges, and spring-loaded piston gauges, were found incapable of measuring with accuracy pressures which increase rapidly, as in the present instance, owing to the momentum of the moving parts causing the gauge finger of the Bourdon gauge, or the piston of the direct acting spring gauge, to move beyond the position corresponding to the actual pressure in the cylinder, and thus the pressures observed are always too high. The Bourdon gauge is also very soon rendered unfit for use by sudden pressures, and it has the great defect that, in such a case as we are now considering, there is no way of seeing, after the gun has been fired, what was the highest pressure attained, unless a loose index finger is fitted, and this is thrown so far beyond its proper position by the sudden rise of pressure that the readings are absolutely useless. A spring-loaded piston gauge is much better than the Bourdon gauge, but it has the same defect as regards momentum of the moving parts, though the liability to error may be greatly reduced by having shorter and stronger springs when rapidly increasing pressures are to be measured. The truth of this will be readily perceived by those who have been accustomed

to the use of indicators on quick-running engines, where the oscillations in the steam and expansion lines of the diagram are fewer and of less depth when stiffer springs are used. In fact, whenever a high-speed engine has to be indicated, the shorter and stronger the spring of the indicator the more regular is the steam line of the diagram, and the same is true of pressure gauges; but even after everything has been done that is possible with spring-loaded piston gauges, they have proved to be greatly inferior to the crusher gauge we now illustrate.

The following description will make the illustration clear: A is the steel base, screwed into the recoil press. B is the cylinder of the gauge, screwed to the base A, and containing the steel piston C, which is fitted with a bronze check ring, D. E is a hard brass wire spring, to keep the piston close up to the soft copper gauge F, which is held in place by a soft india-rubber ring, G. H is the cap of hard brass containing the copper gauge and the end of the piston C. It will be observed that the piston of this gauge is much lighter and moves through a much smaller distance than any other form of gauge can be made to do, and consequently the momentum is so small that it may safely be neglected. The greatest



Crusher Gauge for Hydraulic Gun Carriage.

movement of the piston is never more than about ¼ inch, and the highest pressure in the cylinder is shown by the amount by which the copper cylinder has been shortened. It is also very convenient to have an actual measure of the pressure, which can be kept for future reference. The copper cylinders are made of two sizes, equal respectively to ¼ and ½ square inch in section, and the length is in every case exactly ½ inch. Before fixing them in place, the diameter and length are carefully measured in a Whitworth measuring machine, and after the gun has been fired the length is again carefully measured in the same way; then the amount of compression it has received is looked for in one of the accompanying tables, and opposite to it will be found the pressure per square inch required to produce it. The pressures in the table have been calculated from actual experiments, with copper of the same purity and hardness. The area of the piston is 1.168 square inches, experience having shown that this size just gives an effective area of 1 square inch, the difference, 0.168, being equal to the friction, which is practically constant within wide limits of pressure. A modification of this gauge is used for determining the pressure in the powder chambers of guns at the time of firing; but the principle involved is the same.

Showing amount of compression (C.) of soft copper cylinders, 1-24 square inch area, and initially ½ inch long, with the hydraulic pressure (P.) in pounds per square inch required to effect that compression.

C.	P.	C.	P.	C.	P.	C.	P.
.000	.000	.008	1527	.124	2412	.191	3372
.005	.005	.009	1553	.125	2438	.192	3397
.010	.010	.010	1579	.126	2464	.193	3423
.015	.015	.011	1605	.127	2490	.194	3448
.020	.020	.012	1631	.128	2516	.195	3474
.025	.025	.013	1657	.129	2542	.196	3499
.030	.030	.014	1683	.130	2568	.197	3525
.035	.035	.015	1709	.131	2594	.198	3550
.040	.040	.016	1735	.132	2620	.199	3576
.045	.045	.017	1761	.133	2646	.200	3601
.050	.050	.018	1787	.134	2672	.201	3627
.055	.055	.019	1813	.135	2698	.202	3652
.060	.060	.020	1839	.136	2724	.203	3678
.065	.065	.021	1865	.137	2750	.204	3703
.070	.070	.022	1891	.138	2776	.205	3729
.075	.075	.023	1917	.139	2802	.206	3754
.080	.080	.024	1943	.140	2828	.207	3780
.085	.085	.025	1969	.141	2854	.208	3805
.090	.090	.026	1995	.142	2880	.209	3831
.095	.095	.027	2021	.143	2906	.210	3856
.100	.100	.028	2047	.144	2932	.211	3882
.105	.105	.029	2073	.145	2958	.212	3907
.110	.110	.030	2099	.146	2984	.213	3933
.115	.115	.031	2125	.147	3010	.214	3958
.120	.120	.032	2151	.148	3036	.215	3984
.125	.125	.033	2177	.149	3062	.216	4009
.130	.130	.034	2203	.150	3088	.217	4035
.135	.135	.035	2229	.151	3114	.218	4060
.140	.140	.036	2255	.152	3140	.219	4086
.145	.145	.037	2281	.153	3166	.220	4111
.150	.150	.038	2307	.154	3192	.221	4137
.155	.155	.039	2333	.155	3218	.222	4162
.160	.160	.040	2359	.156	3244	.223	4188
.165	.165	.041	2385	.157	3270	.224	4213
.170	.170	.042	2411	.158	3296	.225	4239
.175	.175	.043	2437	.159	3322	.226	4264
.180	.180	.044	2463	.160	3348	.227	4290
.185	.185	.045	2489	.161	3374	.228	4315
.190	.190	.046	2515	.162	3400	.229	4341
.195	.195	.047	2541	.163	3426	.230	4366
.200	.200	.048	2567	.164	3452	.231	4392
.205	.205	.049	2593	.165	3478	.232	4417
.210	.210	.050	2619	.166	3504	.233	4443
.215	.215	.051	2645	.167	3530	.234	4468
.220	.220	.052	2671	.168	3556	.235	4494
.225	.225	.053	2697	.169	3582	.236	4519
.230	.230	.054	2723	.170	3608	.237	4545
.235	.235	.055	2749	.171	3634	.238	4570
.240	.240	.056	2775	.172	3660	.239	4596
.245	.245	.057	2801	.173	3686	.240	4621
.250	.250	.058	2827	.174	3712	.241	4647
.255	.255	.059	2853	.175	3738	.242	4672
.260	.260	.060	2879	.176	3764	.243	4698
.265	.265	.061	2905	.177	3790	.244	4723
.270	.270	.062	2931	.178	3816	.245	4749
.275	.275	.063	2957	.179	3842	.246	4774
.280	.280	.064	2983	.180	3868	.247	4800
.285	.285	.065	3009	.181	3894	.248	4825
.290	.290	.066	3035	.182	3920	.249	4851
.295	.295	.067	3061	.183	3946	.250	4876
.300	.300	.068	3087	.184	3972	.251	4902
.305	.305	.069	3113	.185	3998	.252	4927
.310	.310	.070	3139	.186	4024	.253	4953
.315	.315	.071	3165	.187	4050	.254	4978
.320	.320	.072	3191	.188	4076	.255	5004
.325	.325	.073	3217	.189	4102	.256	5029
.330	.330	.074	3243	.190	4128	.257	5055
.335	.335	.075	3269	.191	4154	.258	5080
.340	.340	.076	3295	.192	4180	.259	5106
.345	.345	.077	3321	.193	4206	.260	5131
.350	.350	.078	3347	.194	4232	.261	5157
.355	.355	.079	3373	.195	4258	.262	5182
.360	.360	.080	3399	.196	4284	.263	5208
.365	.365	.081	3425	.197	4310	.264	5233
.370	.370	.082	3451	.198	4336	.265	5259
.375	.375	.083	3477	.199	4362	.266	5284
.380	.380	.084	3503				

Proportions of Locomotive Cylinders.

Mr. R. Atkinson, head mechanical draftsman of the Canadian Pacific Railway, writing on the subject of "Proportions of Locomotive Cylinders," in the last issue of *The National Car and Locomotive Builder*, says:

In forming a basis for a discussion of this subject, the first considerations are, (1) the amount of work to be done, (2) the kind of service to be performed, and (3) the conditions of the weather, &c., in which the engine is to perform the given service. The latter of these being the most variable and uncertain in its variations, and the power of haulage of the engine varying in a direct ratio with it, renders it necessary to enter into a full understanding of how much the power is affected. Since (by Molesworth) the adhesion per ton (2240 pounds) amounts, in good weather and with dry, clean rails, to 600 pounds, while on frosty rails it falls to 200 pounds per ton, it follows that the gross weight of train which it is possible to haul in the latter case is only one third that in the former—in other words, the haulage in winter is, or may be, only one third, or 33 per cent., of that possible in summer, a decrease of 67 per cent. This is also variable to some extent, being greatly decreased by hard ice on rails and in flanges, and increased by frequent passing of trains over the road, thus cleaning the rails to some extent; still, even this improvement is lost where snow is drifted rapidly across the track; however, as the whole road is, probably, never equally bad, an average loss of 50 per cent. of haulage power may be assigned for hard winter service. Of course, there are some short periods of a few days in each winter when these circumstances do not exactly hold good.

The power of an engine, other things being neglected, thus depends directly on the weight on the driving wheels multiplied by a factor of adhesion depending upon the weather, which factor becomes rapidly less in the particular kind of weather in which it is most required. The service required is, without doubt, at its maximum in the summer for most railways, but probably the decrease in general winters does not amount to more than 25 per cent. (and is partially due to delays causing loss of traffic), and the service has to be performed with a decrease in haulage power of 50 per cent. Relatively, then, the total power being equal to the service in summer, it follows that the power would be only 67 per cent. of the service required in winter. To state the problem generally, it is found in the service of all railways more difficult to provide sufficient haulage power in winter than in summer, and this in no slight degree, though varying on different roads. The direct cause of this difficulty is that the engines "slip" to such an extent that the loads have to be diminished to suit the power—i. e., to suit the adhesion, or the adhesion increased by defective means such as "double heading," which is most objectionable, and the result is the same—viz., loss of power at command by this double heading. It is thus self-evident that the means are at hand to overcome the greater part of the trouble by increasing the adhesion to suit the requirements of winter service—i. e., the engines should be designed so that the adhesion shall be more in proportion to the winter service than to that of the summer.

The next section of the subject is the principal one—that of cylinder power or proportions—when the adhesion (or weight on driving wheels), the boiler pressure, size of driving wheels, and the class of service are given. The boiler pressure most appropriate to conditions of service is a very open question, and is gradually undergoing considerable change. The size of driving wheels depends directly upon the service required. The class of service comprises freight or passenger, either local or express, and switching, and the general conditions of track on which the service has to be performed—i. e., the maximum grade and its length, the longest grade and its incline, also the sharpest curve and percentage of curves to tangents, and of grades to level track. In the case of fast passenger service (which usually makes the heaviest demands upon the designer) a full description of the section of road should be given.

In designing the cylinder proportions, the first point to consider is the piston speed. Given the speed of the train at its maximum and the size of the driving wheel, the revolutions of the wheel should not exceed 300 per minute, and the stroke should be such that the piston speed should not then exceed 1000 to 1050 feet per minute, under conditions similar to those of a passenger train at 60 miles per hour—probably 700 feet piston speed per minute would be high enough at average speeds—even the length of the stroke as above deduced may require to be decreased if extra long side rods are required or considered desirable for other reasons. It may be accepted that it is not safe to run side rods of flat section 9 feet long at 24-inch stroke, and at a speed of 60 miles per hour for general service, as the proportion of failures would be unwarranted.

Considering such a stroke to have been selected as will fulfill the above conditions, which is a mere matter of calculation, it then only remains to find such a diameter of cylinder as will develop the required energy to haul the train at the maximum speed when cut-off occurs at a point sufficiently short to prevent any loss of speed from back pressure. As this depends greatly upon passages, &c., it may be taken for granted that if the motion is a well designed one of the American type, the full gear cut-off being at about 21 inches—the stroke being 24 inches—that at high speeds, with full train, the cut-off will be at about 8 inches from commencement of stroke. Then the average cylinder pressure in full gear should not be more than 15 pounds below the boiler pressure, and the diameter of the cylinder should be such that this pressure will give out about 500 to 550 pounds tractive force on tread of wheel per ton (2240 pounds) of weight on drivers, taking tires as being new.

A passenger engine with cylinders of the diameter and stroke thus found, and which can just haul a given train on a grade of 1½ per cent. with the motion in full gear, will haul the same train at 45 miles per hour, excluding stops or for long runs, on a fair main line track having a few grades of 1 per

cent. and scattered curves up to 4° or 5°. This has been verified in actual practice. For freight service the cylinder power should be rather less, and the tractive force at tread-wheels is sufficient at 500 pounds per ton of weight on drivers. For switching engines, 450 pounds tractive force is sufficient, as the tracks are nearly always more or less greasy, and the same holds good for regions subject to fog and mist.

Heavy sections of line, such as long grades and a frequent succession of curves, require more engine power—i. e., more adhesion, but the ratio of cylinder power to adhesion should be proportionately less, dependent upon the duration of bad weather, and the cylinder power can then be higher per ton of train. There can be no doubt that if the cylinder powers are above these allowances that considerable loss is sustained by wear of tires and machinery and in consumption of fuel, also great dissatisfaction is caused by the diminution of service to be obtained in winter, with its attendant evils of delays, loss of traffic, abuse of power, and friction among officials. Instances can be easily selected where engines designed so as to fulfill the above conditions have given results quite equal to those expected. One point which is most frequently neglected in designing engines is to ascertain from reliable data the actual heat value of the coal which is to be supplied; an engine cannot be designed to burn coal of fair quality, and probably fresh mined, with economy, and still in such a manner as to give satisfactory results from the scrapings of the coal heap. It should be carefully borne in mind that though a more brilliant superficial performance can be got in fine summer weather by having rather more cylinder power than the above, still it is not so satisfactory all the year round, and is more than paid for in extra cost of repairs and in the excess of fuel burnt per ton hauled, the probable cause of which may be looked for in the increased condensation due to the larger cylinder.

Practical Application of Stability Calculations for Ships.

In an interesting paper entitled "The Practical Application of Stability Calculations," by Mr. A. Denny, presented at the last meeting of the British Institution of Naval Architects, it was attempted to show how captains could be assisted in the safe and economical working of their ships by providing them with certain technical information. For some time past Mr. Denny's firm have supplied with their steamers a pamphlet called by them "Technical Qualities Book," which is divided into two parts, the first containing general notes and the second special notes and diagrams. The first part applies to any ship and the second to the special ship under consideration. The most important technical qualities of a ship are classified under the following headings: Dead Weight, Capability, Speed and Power, Stability, Trim, Measurement, Capacities, Steadiness, Strength, Turning and Maneuvering Power. The diagrams supplied have reference to the dead weight and displacement, horse-power and speed, the loading, ballasting and trim of a steamer. A longitudinal section of the steamer is also added, giving cubical contents of the holds, the position of their centers of gravity, contents in tons of the bunkers and water ballast compartments and the amount of fresh water in gallons. This "Technical Qualities Book" has been supplied up to the present time with 17 steamers. Lately Mr. Denny has devised a means by which the captain is enabled to determine the stability of his ship at any moment during the progress of taking his cargo on board. The instrument consists of a pendulum hung on knife edges, which are fixed at the lower end of a flat iron rod, about 6 feet long, the upper end of this rod being fastened to a wooden board which can be screwed against a deck beam. The pendulum consists of an iron disk and a light wooden lath, 6 feet long, the upper edge of which plays over the surface of the board. To facilitate attachment and the bringing of the index to the zero mark, if the vessel should have an initial list, the board is provided with segmental slots, allowing a certain adjustment either to the right or to the left. To perform an experiment care should be taken that there is no free water in the bottom or bilges of the ship, and that during the progress of the experiment no shifting of weights or movement of large bodies of men on board should take place. The vessel is then inclined by the application of a weight to one side, the most practical way being to fill one or more of the ship's boats resting in their chocks with water. In practice, for a steamer of about 5000 tons gross, it is sufficient to use two 3½ feet lifeboats on each side which would give an inclining movement to either side of about 2½ foot tons. These boats are alternately filled and emptied, and the excursion of the index to the right and to the left of the center line on the board of the pendulum is noted. A sheet containing a set of curves, which are prepared by the builders of the ship, is placed over this board, and the point of intersection of the index with the various curves gives a measure for the stability, metacentric height, amount of cargo, ballast and coal which might safely be shipped at the then mean draft of the vessel. The curves are so constructed that the captain need not have any scientific acquaintance with the various elements on which the safety of the ship depends, but they enable him to read off the required information at a glance. Two steamers have been supplied with this pendulum and sets of curves up to the present.

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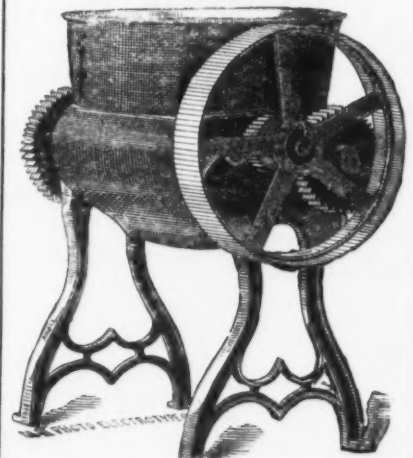
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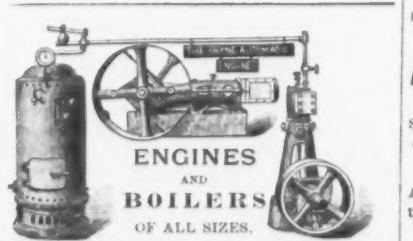
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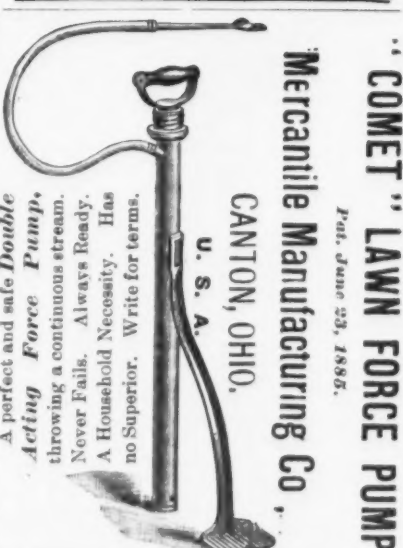
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Our patented Vertical Boiler will not prime. No danger of burning flues.



Adamant Powder.

A new and unexcelled invention for hardening metals and especially Iron and Steel of all kinds. Iron and Steel made nearly impervious. Patented lately and in use in Germany, England, Belgium and patent applied for in U. S.

We are introducing the Adamant Powder in this country and have no doubt that this article, which is easily applied and produces a nearly impervious metal, will quickly gain favor with all who use it. We have two kinds of powder:

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MECHANICAL.

Three-Way Tapping Machines.

Just who designed the first of the now used "three-way tappers" is difficult to say. In an interesting article entitled: "Manufacture of Pipe Fittings in the United States," written for *Engineering*, by Mr. W. D. Forbes, of the well-known firm of Forbes & Curtis, of Bridgeport, Conn., we find the engravings which we annex, and which show the general plan of some of

shown in Fig. 1 at Z, moved into place, and the machine started, so little time is lost while taking out and replacing a fitting. As this change did not prevent at all times the stripping of threads, lead screws were substituted for the levers, which helped to overcome the difficulty, but did not do so entirely, and the question of commercial advantage was not absolutely admitted. The third change has, however, put the question beyond all dispute, and it was this: As the stripping seemed to occur at the moment of reversing, it was proposed to start the taps differentially—that is, one to be allowed to

has mounted upon it spur and bevel pinions E and F, E transmitting power to the spur gear G, and F to the bevel gear H, which in turn through the bevel and spur pinions K and L transmits power to the spur gear M. On large machines a second pair of pulleys are used in the same relative position only on the left. In dotted lines through the spur gear G is shown a steel spindle C which carries a tap. A spline or keyway is made in it for about one-third its entire length. On this spindle is fitted a cast iron disk as shown by dotted lines at G; a key in this disk fits into the spline of the spindle, preventing it from turning, but yet permitting a sliding movement of the spindle through it.

Fig. 3 gives a detail view of the disk, which, it will be noticed, has a segment cut from it. In the other two disks fitted to the gears M and H this segment is of different widths, none of the three being the same. Into these spaces project from the gears M, H and G lugs, which it is evident, when the machine is started, must come in contact with one side of the segmental spaces, and they being of different widths start the spindles at different moments, and when reversed act in the same way against the opposite sides. The spindle C carries the spur gear G, which has a cylindrical extension or sleeve, on the end of which is cut gear teeth for a purpose which is to be explained later.

The outboard end of the spindle C is shown threaded, as are the others, A and B, but on the extreme end of C is a disk, which of course, travels forward and back as the machine feeds in and out, the use of which will soon be apparent. The gear teeth cut on the sleeve of the spur gear G work into the gear T, which is mounted on a shaft, on the other end of which is the gear S. The bracket which carries this shaft is adjustable, so as to permit change gears to be substituted for T and S. The gear S runs into the gear W, which is threaded to meet the screw on the spindle, thereby forming a nut, and it is prevented from any lateral movement by the bearings on each side of it.

It is evident, then, that if properly proportioned gears are put in place of T and S any desired feed for the spindles can be obtained, but as the number of threads to the inch is eight on all sizes above 2-inch on large machines, this pitch could be cut on the spindle; but it is preferable, for the sake of wear, to make it coarser and give the proper advance by means of gear. On a rod held by two bearings bolted to the main frame are two fingers or triggers, R and P, and the clutch shifter N; to this rod is attached a weight so as to have a tendency to draw it toward the center of the machine, or from right to left. The trigger

tapping a stream of oil is thrown with considerable force into each hole, and it has been found that good oil is by far the most economical, as it allows a greater speed and effects saving in power and wear on taps. The output on first-class tapping machines is on the average about as follows, calling nine hours of actual running a day's work. Ten hours is a day's work, but time must be allowed to grind taps, try gauges and adjust the machines:

Machines worked in pairs, inches.	Each	Or
$\frac{1}{4}$ to $\frac{3}{4}$	700 to 850	1,400 to 1,700
$\frac{3}{4}$ to 1	120 to 100	1,000 to 1,300
1 to 2	80 to 120	100 to 200
2 to 4	50 to 80	120 to 160
4 to 8	25 to 40	50 to 80

The 12-inch machines and longer have not as yet always been used in pairs, and if used singly the man who tends it has ample time to look after a pair of 8-inch machines if they are provided with proper lifting tackle. The feed gears T and S do not have to be changed on what are known as standard fittings on any of the machines except the smallest, the reason for this being that all sizes of pipe above 2 inches, as we have said before, have eight threads to the inch.

Apparatus for Heating, Setting and Removing Tires.

Mr. T. W. Gentry, master mechanic, and Mr. Geo. W. O'Brien, general foreman, shops of the Richmond and Danville Railroad Company, have recently been granted a patent on an apparatus for heating, setting and removing tires, and arrangements have been made with Messrs. Pedrick & Ayer, proprietors of the L. B. Flanders Machine Works, Philadelphia, Pa., for its manufacture and sale. It can be arranged either as a stationary or portable plant. The cut shows the general arrangement of the latter. The old process requires the wheels to be taken from under the engine and then run out to some safe place, where fires are built around them until they are hot enough to come off. This injures the paint and finish of the center, consumes much valuable time and requires a good force of men, except where city gas can be introduced, and when this is possible it is very slow, costly and unreliable; and in order to get sufficient pressure not less than a 3-inch pipe can be used, and then very little or no blast can be applied. The jets burn slowly and irregularly, and consumption of gas is very heavy. The inventors have a patent on the hoop or burning pipe without jets or burners, and cover the heating by gas. With this apparatus and system of doing the work less than one-tenth of the time is consumed, a great saving in labor effected, and the wheel centers are not injured in any way. In case of a loose tire it is not necessary to take down the connections. In taking off or

which were about getting their last re-turning or truing up at that time, have all proved too thin to stand; the friction and the heat thus generated have loosened up all of their tires. We find ourselves compelled to give all of these engines new tires, while the running gear and machinery is in first-rate order, and does not need coming down or being worked upon. It occurred to us that it would be an excellent opportunity to give our gas tire heater a good trial, so the new tires were ordered and specified to be of uniform outside diameters and free of flats, &c., with a view of being run without turning off on outside. They came to hand, and we found them very nearly perfect, and as soon as the first engine arrived for her new tires we chucked two tires on each of our double driving-wheel lathes, and while tires were being bored out to fit wheel-centers we slipped off connecting rods, wheel covers and driver brake clogs or heads (nothing else was removed), jacked up engine until wheels swung over rails just enough to allow flange of new tires to slip over top of rail, and in from 10 to 15 minutes each we dropped off the old tires, and by time the wheel-centers were cooled off the new tires were nearly ready to be applied. We had a suitable frame or heavy trestle, with a running hook and lever, which was placed in position in front of the wheel on which the new tire

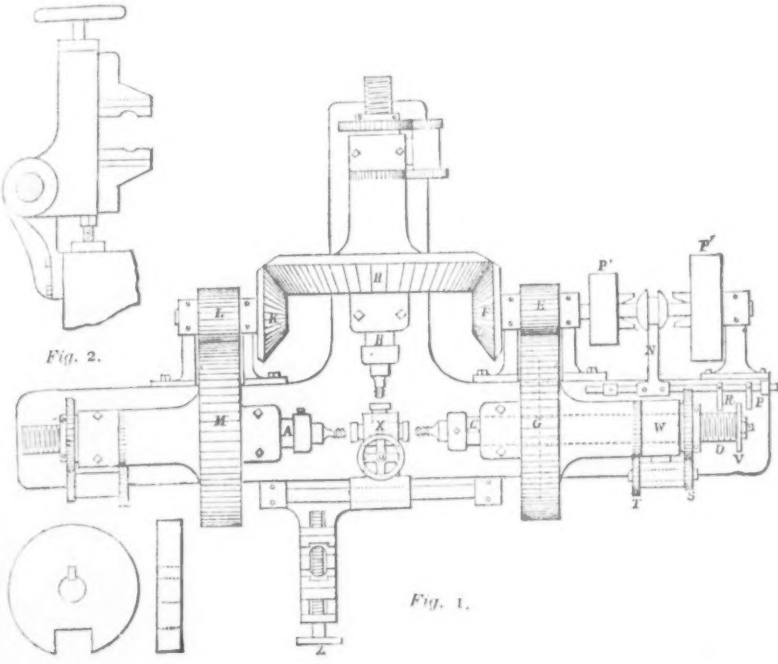


Fig. 1.

THREE-WAY PIPE TAPPING MACHINES.

these machines. The proportions are not exact, but are simply drawn to make the explanation clear.

The idea is to arrange three spindles carrying taps, so that they work together. In the fittings used in the United States a desire to economize in material has caused the bends to be made very short, thus bringing the thread-ways very close together, which is an element of danger in attempting to run several taps into a fitting at the same time, as, if they were made to enter but a thread too far, they would interfere and cause trouble. In order to have this danger reduced to a minimum a stop motion was, even in the earlier days, placed on the machines, the original machines being made with one vertical and two horizontal spindles. The first idea as to holding the fitting was simply a stout, rigid wire in proper position, fitted with cast-iron jaws, so made that the fitting was imbedded, so to speak, in them. The operator sets the machine, puts the fitting in place, starts it, and by placing his foot on a treadle, which, through a system of levers, brings the taps up to their work and feeds them in, the stop shuts the machine off, and, on being reversed, the taps naturally screw themselves out—that is, if it so happened that a thread had been made by their entering, or that, if made, they were not stripped when the reverse motion was thrown on. In short, the first attempt at three-way tapping was not a commercial success. Little by little the cause of failures was discovered. First it was found that the vise, instead of being a rigid affair, must

make a part of a turn before the second started, and then the third spindle to reverse. This was tried, and solved the trouble of stripping, besides lessening the strain on the entire machine. Like the majority of tools, the power required to run a three-way tapper has never been well tested, and all the information that can be given is the belt velocity, width and size of pulleys. The distance between the pulleys is in all cases good—not less than 8 feet. The table below gives all this information, but it must be borne in mind that two belts of sizes given are quite general in medium machines and are always found on large sizes:

Machine, inches.	Belts, inches.	Feet per minute.	Pulleys, inches.
$\frac{1}{4}$ to $\frac{3}{4}$	3	650	8 2 belts
$\frac{3}{4}$ to 1	4	650	10 2 belts
$1\frac{1}{2}$ to 2	5	750	12 2 belts
2 to 4	6	800	14 2 belts
4 to 8	8	800	18 2 belts

The prerequisites then for a first-class three-way tapping machine are as follows: 1. Ample power to drive it. 2. Unusual strength to meet possible strains for hard castings, &c. 3. Ease of access to all parts. 4. Independent adjustment for each tap. 5. Self adjusting and centering vise. 6. Differential start of taps. 7. Positive stopping and reversing design. A general idea can be obtained of the latest designs of this class of tool from the following description and drawings, Fig. 1, which supposes the observer to be looking down on the tool. The machine is shown with taps ready to start work on the in feed; a tee is in the jaws of



Fig. 1.—General View.

FLEXIBLE BACK BAND SAW, MADE BY HENRY G. THOMPSON & SONS, NEW HAVEN, CONN.

R has a slight tipping movement enough to allow a steel toe on its short end to engage with a piece, which is movable in a slot in the main frame, being made fast at any desired point by a set-screw. The finger R is simply a piece of steel which can be slid along the bar and made fast where desired. To start the machine the rod is drawn back by means of a proper lever until the thimble between the pulleys P¹ P² is made to lock

putting on new tires the connections are taken down. In all cases the engine is jacked up so that the wheels will clear the rails about 2½ inches, to allow the burning hoop to be placed around the tire. This hoop is not a continuous ring of pipe; the ends are plugged up and are left a little space apart, so that they can be placed on the wheels while the connections remain on them. One of the main features is the generator, in which are four retorts, heated by coke, coal or wood. Into one of these retorts oil is fed through a very small opening and needle-point valve. This generates gas, which passes into another retort. The two other retorts are for heating the air that is used with the gas, the working of which will be explained later on.

In close proximity is a tank, containing about 10 gallons of common kerosene oil, and at any desired place is an air compressor that supplies air to the device. A very convenient arrangement is an air-brake pump, used for testing brakes, &c. Attachments are made to this oil tank on top, so that an equal air pressure is on the oil that is operating on any part of the plant. This is controlled by a valve at the will of the operator. A larger connection is made with the two air retorts in the generator, so that the air and gas are at about the same temperature, and are propelled by the same force through the generator. From the generator to the burning hoop is made a connection through the pipes of which the gas flows, and in a fitting with an injector nozzle the air mingles with the gas and is forced through the burning hoop that has been placed around the wheel. On the inner side of this hoop small holes are made about 1½ inches apart. The hoop is held off from the tire about 1 inch by small studs. After the furnace has been fired up and the retorts are hot, air is admitted to them; also the oil through the needle point valve, and in a few seconds gas can be admitted into the burning hoop and fired. The amount of flame is regulated by the needle-point valve. When the tire is hot enough the valve is shut off, the flame stops, and the generator also. The gas is made only as fast as used, and is under absolute control. There is no waste and no danger. The points of pressure all have gauges, and can be seen by the operator. The flame that strikes the tire is a blue one and intensely hot, penetrating the tire very quickly. By placing the generator out of doors, along a wall or any convenient place, no more danger need be apprehended than from an ordinary stove. The oil tank, manipulating valves, gauges, &c., are inside close by the track that the engine is run in on.

From a private letter from Mr. Gentry to the manufacturers we make the following extract: "The Richmond and Danville Railroad Company have on their Western North Carolina Division a number of 10-wheel freight engines, whose general condition is very good, with the exception of their tires. Driver brakes having been applied to all of them when last overhauled, their tires,

was to be placed; the tire was suspended in this, and the gas-pipe arranged on it, and tires expanded and set in place on wheel-centers on an average of less than 20 minutes each; or, in other words, the old tires were removed from six wheels and the six new tires put on, and the engine that came in in the morning to get an entire set of new tires was ready for service that same evening. We consumed in all about nine hours' time, and employed one machinist and six laborers in the gang. I wish to add, however, that the tires had only one light cut taken through them, and that I did not take into consideration the men who bored the tires, as this would have had to be done, no matter how tires were applied. This was our first attempt at removing and replacing whole sets of tires without removing wheels from the engine, and we desired to show that it could be done successfully and with great economy. We measured the oil consumed during the whole operation, and it averaged about ½ gallon to an old tire, or 3 gallons for the six old tires, and a little more than 3 quarts for each new tire, or, say, about 5 gallons for the six new tires, making in all 8 gallons, at 8 cents per gallon, making 64 cents for fuel.

Flexible Back Band Saw.

Messrs. Henry G. Thompson & Sons, of New Haven, Conn., are putting on the market a flexible back band saw for cutting metals. Of the engravings which we present on this page, Fig. 1 illustrates a saw frame specially constructed for this tool. The machine can cut at any angle, has an iron table 24 inches square, in which a slide is made level with the top surface, and operated by a screw and hand wheel; it carries the fence for gauging the angle of the cut. The fence is graduated in degrees, and can be quickly clamped at any angle or as quickly removed, leaving the top of the table level and clear. The screw and hand wheel are arranged so that they can be disconnected and the slide moved by hand. The saw wheels have adjusting tension and are made adjustable to line up the saw with the table. The upper and lower saw guides have hardened steel rolls. The weight of the machine with countershaft is 925 pounds; the countershaft has a four grade cone. A brazing fixture goes with each machine, the saws being brazed together in the usual manner. The band saw being specially designed for metal cutting is tempered as shown in Fig. 2, the teeth being so hard that a file will not touch them, while the back is soft. These flexible back band saws, it is claimed, will run until worn out, and when in that condition are thrown away, their cheapness justifying that action. This particular type of saw will be found of the greatest convenience in cutting metals of all descriptions, not only in machine shops, but in foundries, for brass, iron, pipe, &c., as it does not require skilled labor, is always ready, is one of the handiest tools to run to, doing its work quickly and obviously with less trouble than a lathe or planer.

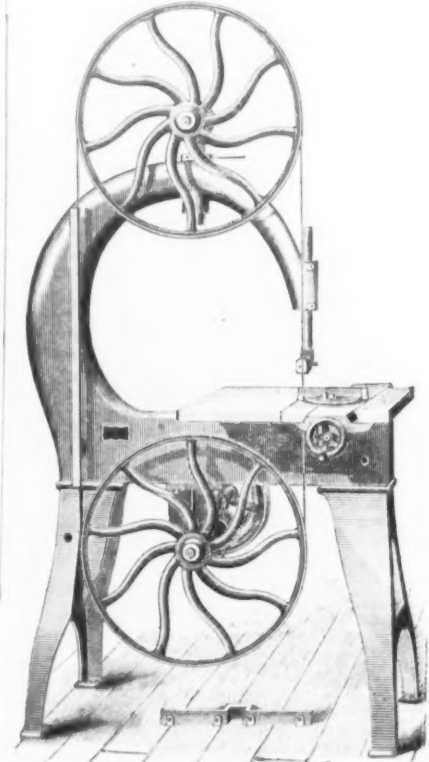
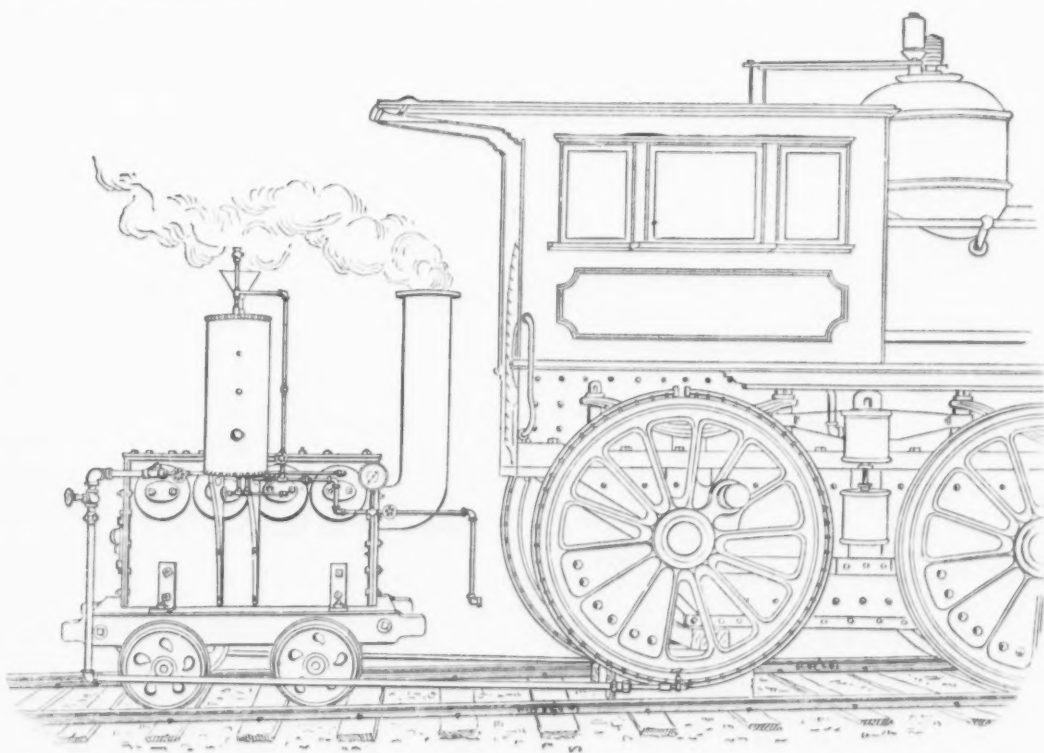


Fig. 2.—Detail View of Saw, Illustrating Method of Tempering.



APPARATUS FOR HEATING, SETTING AND REMOVING TIRES.

Made by Pedrick & Ayer, Philadelphia, Pa.

have play, to a certain extent, as did the swing chuck on the drill press. This was overcome by having the chuck hinged like Fig. 2; it will be seen that the fitting in this vise will have quite an amount of up-and-down play, and by a loose fit on the bar, right and left motion is allowed, which does not require to be more than ¼ inch at the fitting. The hinge system has another advantage, as it allows the fitting to be swung, or folded back, so that it is in a convenient position to take out, and when folded back it may be slid to one side on the bar out of the way, and the second chuck,

the chuck X folded into position, while a second chuck Z is slid to the left and thrown back, with jaws upward ready to receive a fitting. The power to drive the machine is taken from an overhead countershaft which is belted to the main line by cone pulleys in order that proper speeds may be obtained on the various sizes to be tapped; this countershaft need never be stopped, except to shift the belts. From it run belts to the two friction pulleys P¹ P² shown at the back and right of the machine, the larger one driving in and the smaller for greater reversing speed. The shaft driven by these pulleys

the larger one, and at the same time raises the weight, and the engagement of the toe on trigger R prevents the weight from drawing it out.

As the spindles feed in, the disk V on C is gradually moved toward the trigger R, and at last comes in contact with it, releasing the weight, which immediately throws the rod to the left, unlocking the pulley P¹ and locking P², reversing the machine, and running the spindles back until the finger P is engaged by the disk V, which finally lifts the weight and rod, unlocking the pulley P¹, and the machine comes to rest. During the

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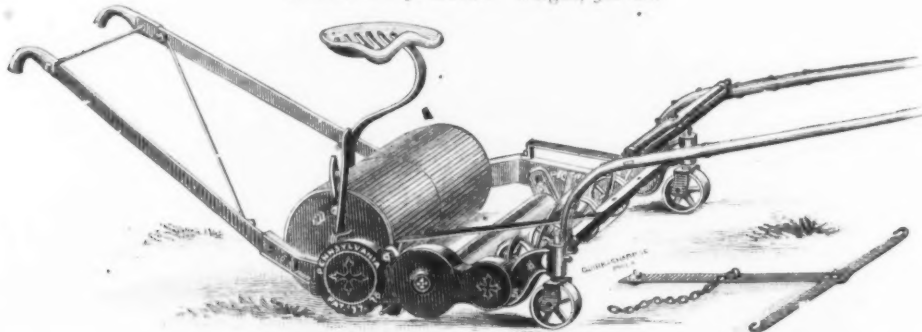
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PENNSYLVANIA HORSE LAWN MOWER.—Open Cylinder.

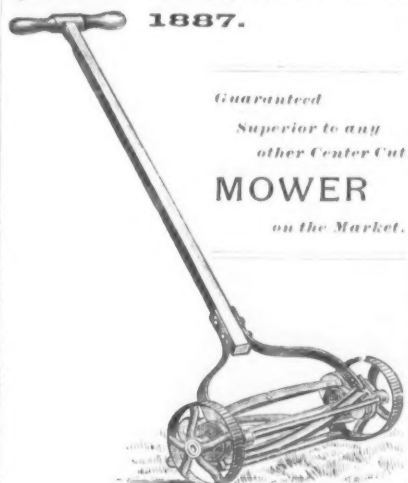
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Width of cut 30 inches. Weight, 320 lbs.



Horse Mower, Open Cylinder, 30 inch Cut, with Handles and Draft Irons, - - - \$110.00
Extra for Seat, Spring and Foot Board, - \$8.00 | Extra for Shafts, - \$7.00
We recommend the Mower with Draft Irons only. Discount on Horse Mowers is not same as on Hand Mowers.

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The trade will soon find an ordinary and roughly-made Reel of blades and stationary knife is not all that is required to make a perfect Lawn Mower.

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The Cylinder Knives are solid cast steel, made by a patented process; are hardened and tempered in oil, self-sharpening, and never require a file or stone after leaving the factory. All the bearings are long, so that the wear on the Mower will be slow, and oil seldom required. It is made to run at high speed, and will not only cut higher grass, but leaves the lawn perfectly smooth.



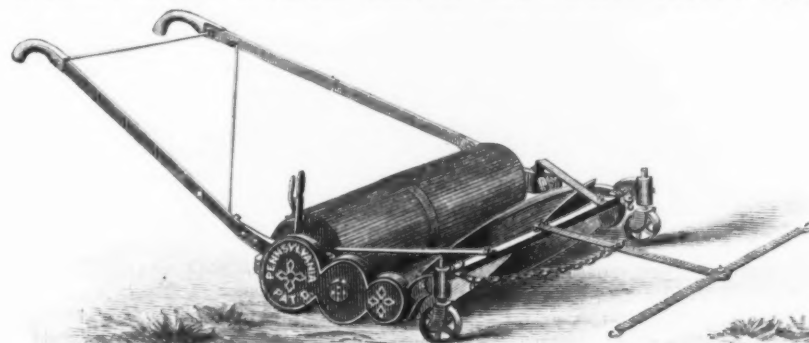
Cutting Bar in the rear adapting itself to all unevenness of the ground.

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Horse Mower, Closed Cylinder, 30 inch Cut, with Handles and Draft Irons. Price, \$100.00
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Discount on Horse Mowers is not same as on Hand Mowers.

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We are the sole manufacturers of Silver Steel Saws, and enjoy the distinction of not only having first introduced the best Saws, among which are the Champion, Diamond and Dexter, but of improving and maintaining the quality of Saws to a degree which challenges comparison.



Ground substantially uniform gauge on the toothed edge, and any gauge required on the back.

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To those who are in the market for Castings:

We should be pleased to have you send us drawings, cuts or sketches, or preferably samples of the castings you are using and allow us to quote you our prices. It would be still better to forward patterns with a small trial order on which we will agree to make a satisfactory price. We are confident of our ability to produce castings of the finest quality known to the trade at reasonable prices. We use only the best obtainable materials and approved modern appliances. We employ only steady and intelligent skilled workmen, paying them good wages. While this may make our castings cost more per pound than those of cheap material and poor workmanship, we will guarantee ours to be much less expensive to the user in the end, because of their proper weight and the time and labor saved in the drilling, planing, turning, filing or other finishing. We prefer the reputation of being a high-priced house which does only the very best work to the name of a cheap producer of rough, hard and low-priced castings, out of



shape or of heavier weight than the patterns call for. It is astonishing to notice how much extra weight can be (and often is) added to a casting by a careless, incompetent molder, rushing out piece work at starvation wages! This is generally overlooked by buyers of cheap (?) castings.

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We have facilities for wood and metal pattern making, drilling, polishing, plating, japanning and the manufacture of hardware and light machines by contract.

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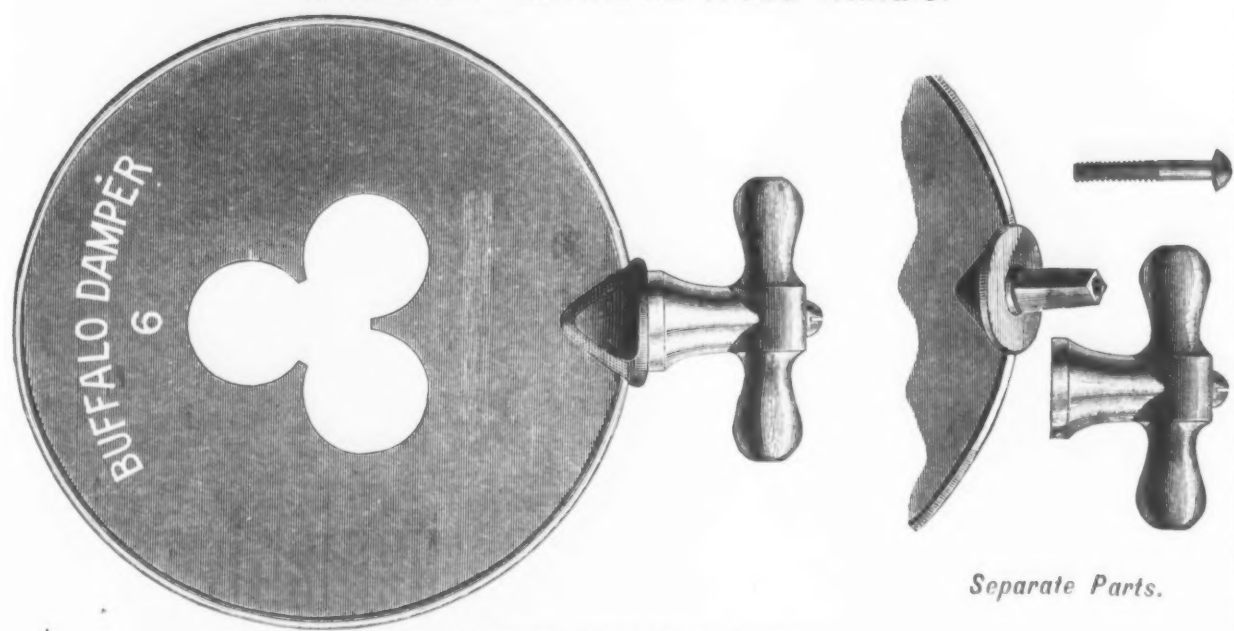
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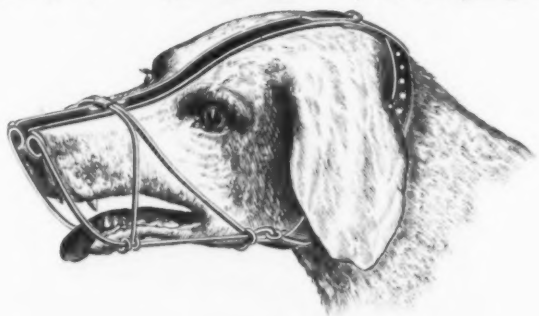
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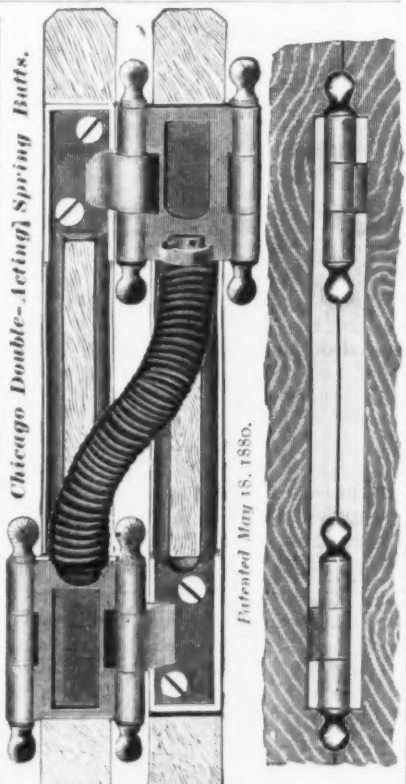
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The Strike of the Coke Workers.

Last week witnessed the inauguration of another large strike in the Connellsville coke region. It will be remembered that immediately following the advance made by the syndicate in the price of coke from \$1.50 to \$2 per ton, the workers demanded an advance of 20 per cent. in wages. This demand was refused by the operators, who agreed to advance wages 5 per cent. This, in turn, was refused by the workmen, and after considerable trouble, it was finally agreed to decide the controversy by arbitration, and John B. Jackson, of Pittsburgh, was appointed umpire. Several weeks were spent in hearing the testimony of both operators and workmen, when the umpire finally gave his award, the substance of which is as follows: "After a thorough and careful consideration of the evidence brought before me on the question concerning the article in your agreement of December 24, 1886, reading to take under 'advise' a just advance in wages when the selling price of coke is advanced, and after having seen the contracts for the delivery of coke and verified the statements made by Secretary Atcheson and submitted by him to the arbitrators, I find that there should not be any advance in wages until there is further advance in price of coke." From the fact that the workmen had been offered an advance of five per cent. and refused it, the effect of this decision upon them can be imagined. A call for a meeting to be held at Everson, Pa., on the 30th ult., was at once issued. At this meeting the following resolution was unanimously passed:

Resolved, That we demand an advance of 12½ per cent. from May 1, and give the operators until next Tuesday (May 3) for an answer.

This demand was considered by the operators at a special meeting held in Pittsburgh on the 2d inst., and the following reply, which we give in full was drawn up by Secretary Atcheson and forwarded to the representatives of the two labor organizations in the region:

"Ever since the unfortunate strike in the Connellsville region, over one year ago, the operators have used every endeavor to prevent a repetition of a disaster that reduced some of their employees to the point of starvation, forcing them to appeal to public charity for food for their wives and children, bringing not only idleness on themselves but on ten times their number of workmen on the lines of railroads and in blast furnaces, mills, foundries and shops dependent on Connellsville coke for fuel. This demand was accomplished by granting practically every demand made upon the operators until the present cost of producing Connellsville coke is very much higher than any other similar fuel in the United States. Each demand made on the operators was coupled with a proposition to submit the same to arbitration should it be considered unjust or unfair. The last demand made was so manifestly unjust and unfair that the operators decided to submit same to arbitration and abide the result. The arbitrators on the workmen's side were selected by open ballot, and they pledged themselves personally that the action of the board would be binding on their side. The article of agreement for arbitration was signed by the officers of both labor organizations, binding them as it did the operators to abide by the action of the board, or in its failure to agree to accept the verdict of the umpire. The workmen's side was ably presented and earnestly argued before the entire board in the presence of the umpire. The board failed to agree, and the case went to an umpire whose reputation for fair dealing, integrity and justice never has been questioned. The final argument on the workmen's side was the last paper submitted, and was sent to him by mail when 1500 miles separated him from answer or inquiry on either side. His decision was based on sworn statements and written arguments prepared by both sides. To claim that it was rendered without understanding every fact in the case would be an injustice to those presenting the case to him. The decision was that there should be no advance in wages until there was an advance on the selling price of coke. Had it been otherwise the operators were bound to comply. As it is, the workmen, through their representatives, are equally bound. The signed agreement of both labor organizations pledge their honor and good faith of every member to accept the award. To accept it for the past and formulate a demand for an advance immediately afterward is a direct violation of the terms of the agreement and the award of the umpire. It makes the principles of arbitration a farce, and renders impossible in the future any method by which employees can be intelligently advised of the merits of demands for advances or reductions of labor. Reduction of wages are as often matters of arbitration as advances, and should be as fairly and justly considered. The operators intend to keep the same good faith as they held when they agreed to enter into arbitration, and cannot believe their employees will do otherwise. Should there be any advance in the selling price of coke the decision binds the operators to an advance in wages, but no advance can or will be given until then. The disasters of a strike must follow to those who inaugurate same."

On Tuesday afternoon, the 3d inst., the delegates of the Amalgamated Association held a meeting at Everson, Pa., to take action on the syndicate letter which had previously been received. Several motions were made as to what action should be taken, and after considerable debate the following resolution was passed:

Resolved, That we notify Secretary Atcheson that the letter of the syndicate is rejected, and that all work cease at once till the demand is granted.

The strike which has commenced, and which will no doubt entail considerable loss both to employer and workman, is to be seriously regretted. It is estimated that fully 15,000 men are thrown out of employment, the idleness of whom will cause much suffering among their families. In view of the fact that the workmen were the first to suggest arbitration, and, having gained that point, refused to abide by the decision of the umpire, the operator would appear to be re-

lieved from any responsibility in the matter. From present indications the strike will be bitterly fought by both sides.

Foreign Markets.

PARIS, April 30, 1887.—*Metals.*—The week has been a dull one with the exception of Copper, and prices are lower. We quote at the close in francs: 100 kg. Copper, Cath. Bars, 102.50; 100 kg. Ingots and Slabs, 112.50; Best Selected, 115; and Pure Corrodon Ore, 106.25 showing an improvement in all but Cath. Bars. Tin, Banca, 276.75; Indion, 253.25; Straits, 250; and English, 250. Lead, 31.25; 31.25; and Spelter, 37.75. The London market in this city is depressed and unsettled at 12.25 francs per 100 kg. for Flooring, and 12.75 for sheet. Old rails are neglected at 7.50. Advances from the Northern Department are more favorable, foundries are busier, prices remain the same. At Charleville, in the Ardennes, no fresh orders have dropped in, but rolling mills and foundries are actively engaged in filling previous commands. At St. Etienne, in the Haute-Marne, the situation is slowly improving. In Central France, at St. Etienne, there is an abundance of orders for the navy; furthermore, for the navy of Japan and Greece. Crueset Steel will be used for arming the cruisers ordered.—*Mouvement des Interets Matieres.*

BRUSSELS, April 30, 1887.—*Iron.*—The comparative scarcity and dearth of Pig imparts strength to the market for finished, but the latter is quiet. Fortunately the usual spring orders procure rolling mills in the aggregate work enough to keep them all going; in this manner the general situation, if not brilliant, is maintained in a satisfactory condition, vastly more so than was the case last year at this time. With but few exceptions, foundries are also well booked. Thy-le-hateau Foundry Pig is selling at 7.55 francs per 100 kg. No. 1, No. 2, 6.25; No. 3, 6.00. Beams are selling extensively at 10.50 francs per 100 kg.—*Mouvement des Interets Matieres.*

HAMBURG, April 30, 1887.—*Iron.*—In Rhenish Westphalia buyers continue holding back, but the market is kept steady by makers being kept busy in filling former orders they had booked. Orders of blast furnaces have sold out their make for the second quarter, to contract beyond it consumers do not seem to feel disposed. Prices remain steady, consumption fully absorbing the output. Rolling mills have about as much work on hand as they can conveniently attend to. The general demand remains active, for beams especially so. Associated makers cling firmly to the price list agreed upon, which does not prevent dealers from underselling them with lots bought cheap some time since. Thick Sheets are dragging, but, owing to the little stock on hand, there is no shading. The Wire branch begins to feel the momentary cessation of the export demand and lowers prices accordingly. Steel works continue doing well on the whole, some even resume working over night. Car works are getting on tolerably well; machine-shops, foundries and boiler makers report a slight increase of orders, but prices obtained are the reverse of remunerative. There is a most active demand, however, for Cast-Iron Pipe for gas and water works. In Upper Silesia there is still a large demand for Forge Pig for export to Russia at 50 marks per ton. Rolling mills have agreed on a common sales office for three years and are in hopes that eventually Rhenish-Westphalia may join. The price of 120 marks for Merzhauser Pig is admitted to by consumers without hesitation. In the Wire branch no weakness is perceptible in Upper Silesia, makers are booked all the way to August. Germany and Luxembourg are doing well during the first quarter 85,818 tons of Pig iron, against 84,115 last year. This year's production consists of 161,180 tons. Forge and Spigel, 36,752 tons; Bessemer, 75,542 tons; and 11,230 Foundry. Metals. Lead has been quiet; Copper steady. Spelter dull. Iron for export weaker, with little doing.—*Bursenhalle.*

ROTTERDAM, April 27, 1887.—*Tin.*—From being firm early last week our market has weakened by degrees, winding up at 61.75 guilders for Banca spot and next sale; Billiton spot, 61.35, and 61.62½ July.—*Koch & Vloetboom.*

BILBAO, April 23, 1887.—*Iron Ore.*—No contracts have come to pass during the week, the only sales being of single cargoes at rather irregular figures, at 7.50 for Campañil, and 6.75 for 6 in. Kublos Superiores. An offer for 6 for the latter was rejected, and such has been the case with 10,000 tons Campañil, for which 7.50 was offered and refused; the owner insisting on 7.50. Dry weather has facilitated shipments, of which 12,335 tons were made during the week, the largest export on record. Total shipments since January 1, 13,722, 850 tons, against 1,018,000 same time last year. Pig iron is moving off steadily, both for export and coastwise.—*Bilbao, Martena y Camarero.*

PORT OF SPAIN, TRINIDAD, April 1, 1887.—*Asphaltum.*—Our market has been moderately active at \$9 for Boiled and \$8 for Crude per ton, shipments since January 1, amounting to 450 tons, against 1083 last year, and 508 in 1885. Exchange, Colombia, bills on London, 30 days sight, \$1.80. E. P. Mason.

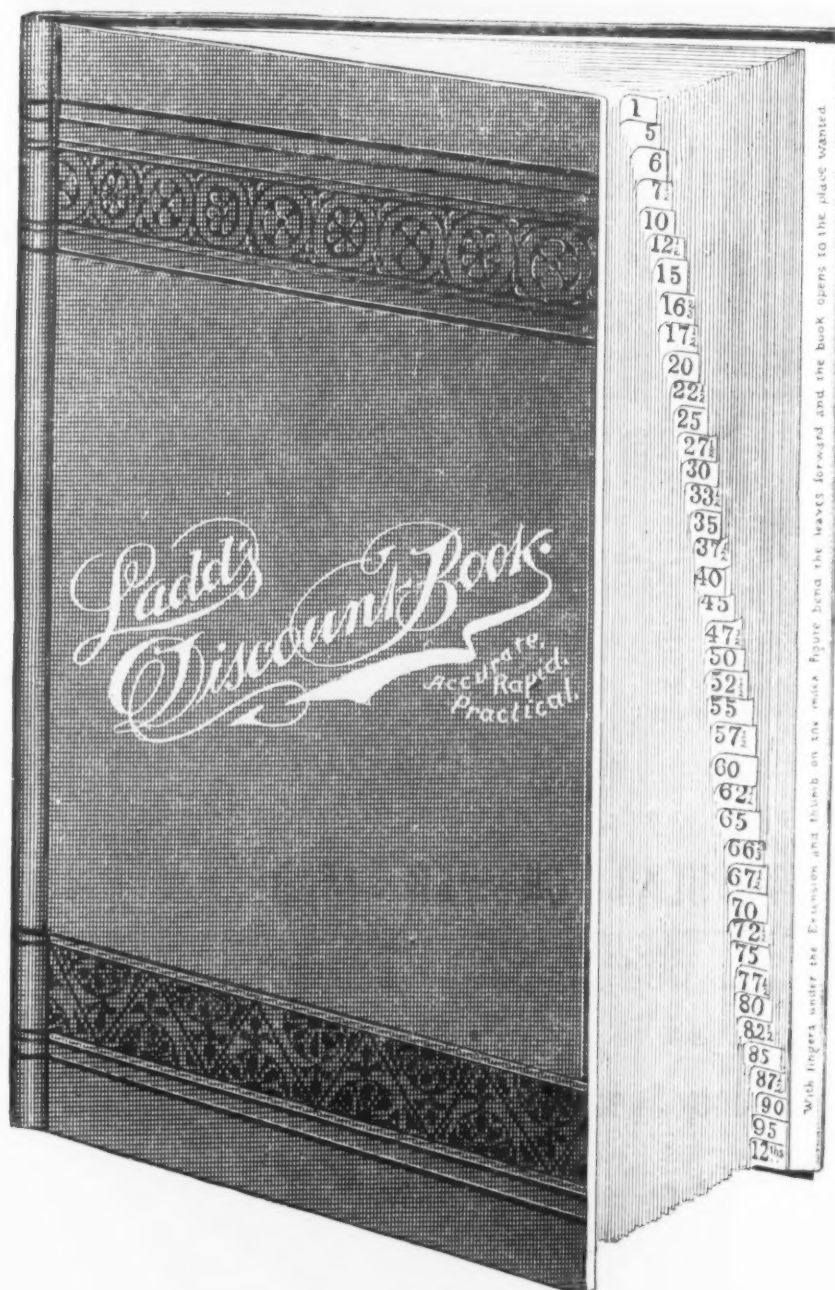
CHILE.
VALPARAISO, March 11, 1887.—*Copper.*—Soon after the last mail 600 tons sold at \$16.25, 600 at \$17 per quintal, at an exchange of 23 ad. 50. Since then the rise in the latter caused exporters to withdraw, only a small lot selling at \$16.50. The closing figure is \$16.90, equal to \$28.17 in England, with 27.6 freight per steamer, and 23 ad. exchange. Nitrate. The rise in ocean freights caused holders to become more tractable, prices dropping to \$2.25, 50 c. and \$2.00, 50 c. and 50,500 quintals changing hands, at equal to 7.14 per cwt. in England. February export has been 2,000 tons to Europe, and 1,000 to the United States. There were still loading on the 1st inst., 15,000 for the former and 12,000 for the latter, and since February 23, there were chartered 11,000 tons for Europe, and 2000 for the United States. Coal—Has remained firm at following quotations: Newcastle, West Hartley, 25 s. 6d.; Orrell, 23 s. 6d.; and Australian, 21 s. 6d. Exchange, 30 days' London, closes at 25 ad. 50.—*Wheeler & Co.*

PENANG, March 22, 1887.—*Tin.*—Opening a fortnight ago at \$9.99 per pound, there was a slight drop to \$9.79 soon after, but subsequently a rally carrying the closing figure to \$9.76. While the receipts amounted to 7500 pounds, sales reached 8000 for Europe. From January 1 to March 12, there were exported from here 31,314 pounds to England; 1310 to the Continent, and 546 to the United States. Exchange four months' bank, on London, 3 3/4 @ 3 1/2.—*Schmidt, Kustmann & Co.*

Screw Propellers.—Speaking of screw propellers in a paper on "Recent High-Speed Twin Screws," read a short time ago before the British Institution of Naval Architects, Mr. E. A. Lannington remarked that, with a given screw, the loss due to friction may be taken to vary approximately as the square of the speed. This is not to say that the frictional resistance is greater in proportion to the thrust at high than at low speeds. The blades of screws for any speed should be as smooth and clean as possible, but for high speed screws the absolute saving of friction may be considerable with an improvement of the surfaces. There is no permanent advantage in polishing the blades. No doubt there is some advantage for a little time, and, probably, better results may thereby be secured on trial; but the blades soon become rough, and shell-fish and weed appear to grow as rapidly on recently polished blades as on an ordinary surface. It appears that within certain limits mere shape of blade does not affect the efficiency of the screw; but, with a given number of blades and a given disk, the possible variations in the form or distribution of a given area are such that different results may be realized.

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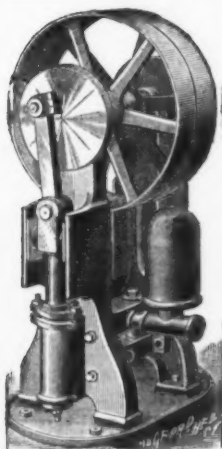


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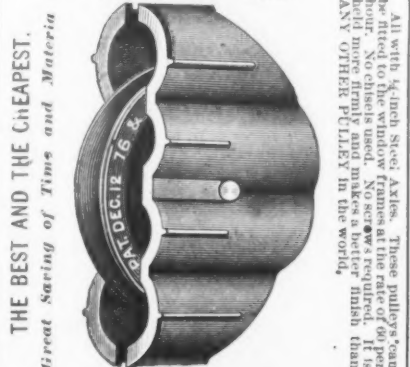
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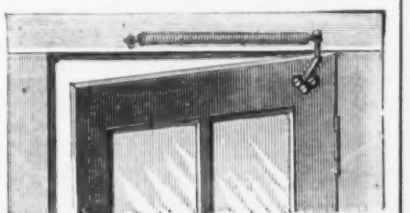
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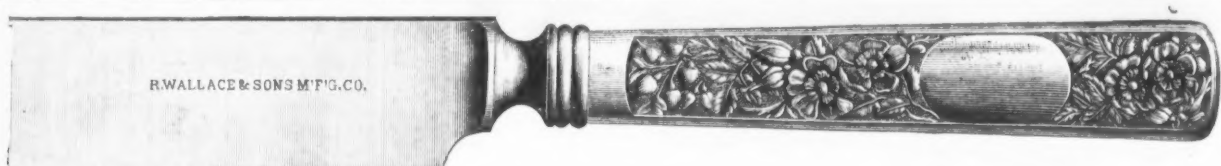
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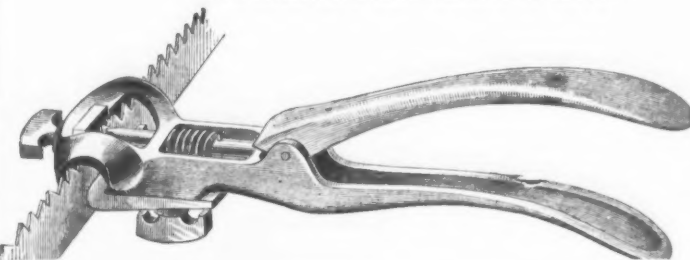
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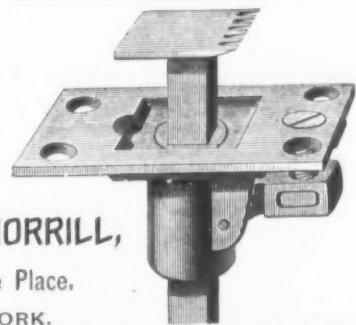
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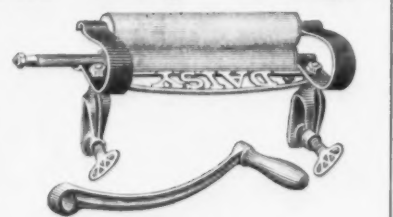
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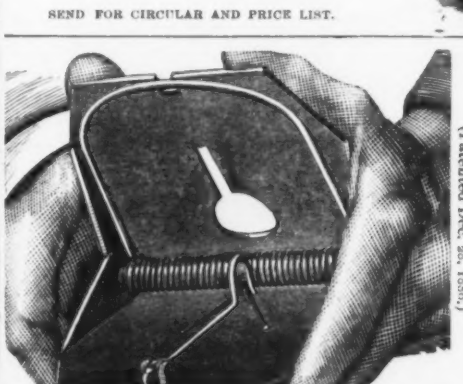
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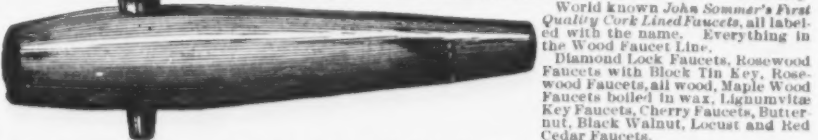
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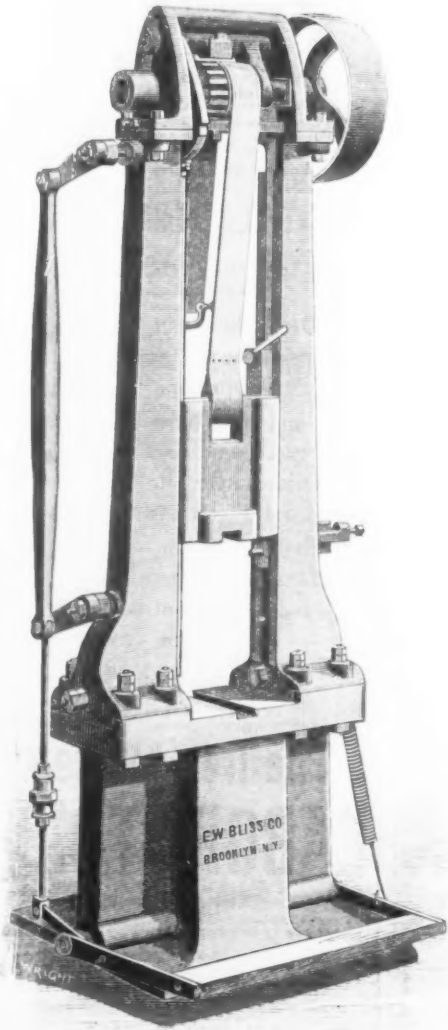
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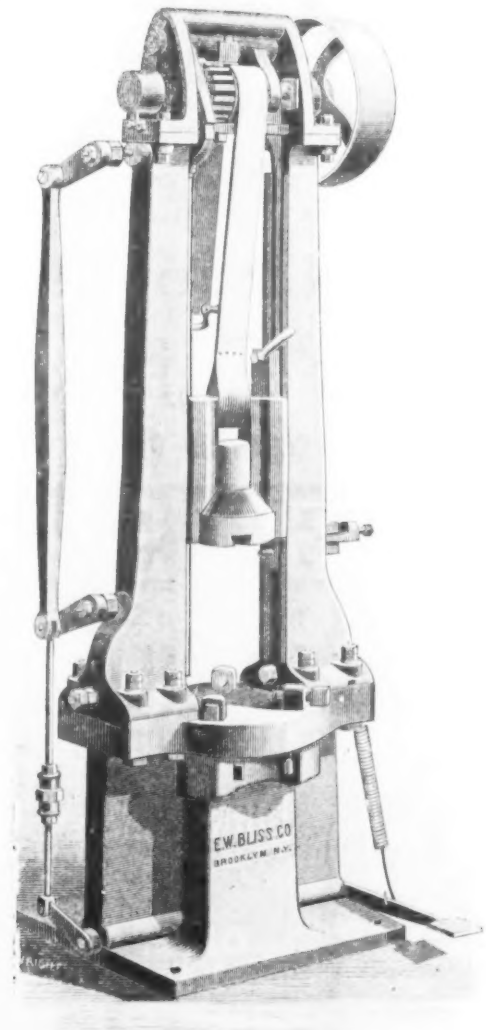
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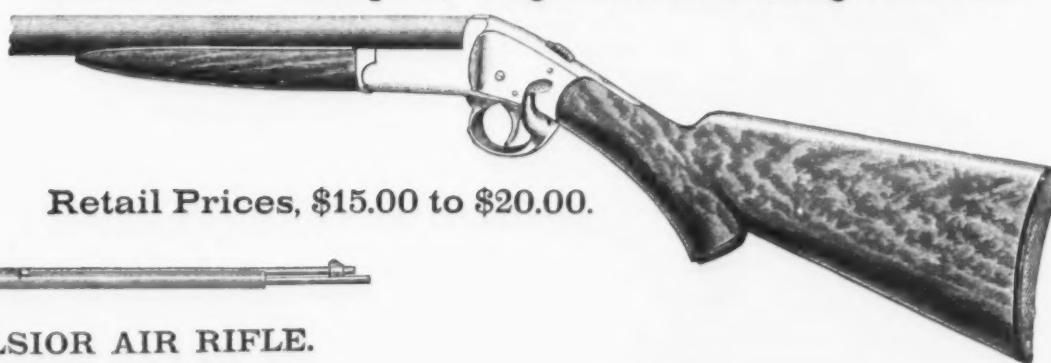


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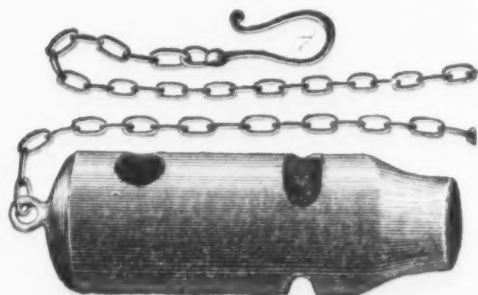


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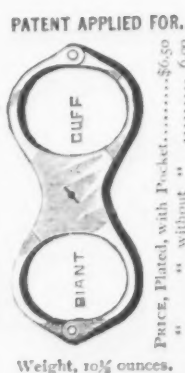
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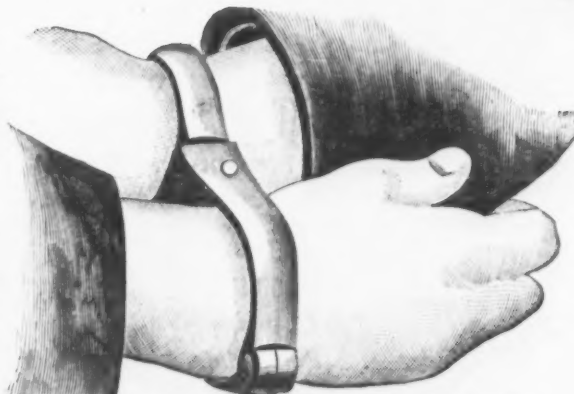
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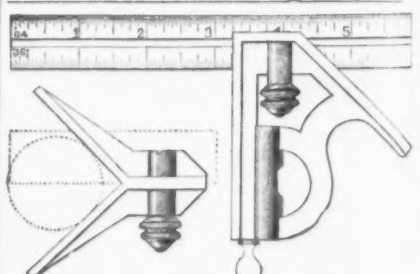
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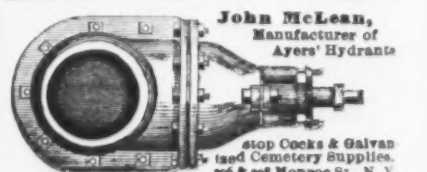
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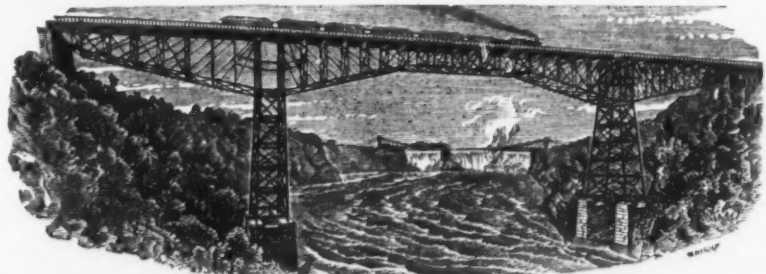
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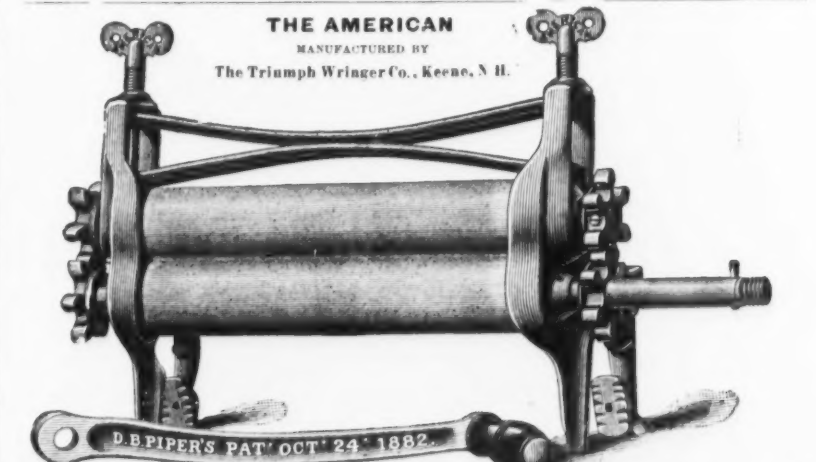
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BARLER SIFTER.

BEST IN THE WORLD.
THE ONLY SIFTER in the market
which can be operated with one
hand. It does not grind impurities
through the wire cloth, like other sifters.
With one hand grasp the Wooden
Handle (do not touch any other part) and
then shake the sifter sideways.
PRICE REDUCED—\$2.00 DOZ.
Illustrated Price List containing all goods
of our manufacture supplied
on application.
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BUFFALO, N. Y.
C. Sidney Shepard & Co.,
CHICAGO, ILL.



C. H. GURNEY & CO., 247 & 249 Lake St. & 7 & 9 Market St., Chicago, Ill
AGENTS FOR THE NORTHWEST.

TOWER'S CHAMPION SCREW DRIVER.

SOLID BOLSTER AND FLUTED HANDLES.
Patented May 15, 1877 and April 29, 1879.
Hand Forged. Tempered in Oil. Warranted.
EVERY BLADE TESTED AT THE FACTORY.
MADE BY
TOWER & LYON, 95 Chambers St. New York.
BROCK'S PATENT DROP FORGED CHAIN PIPE WRENCH.

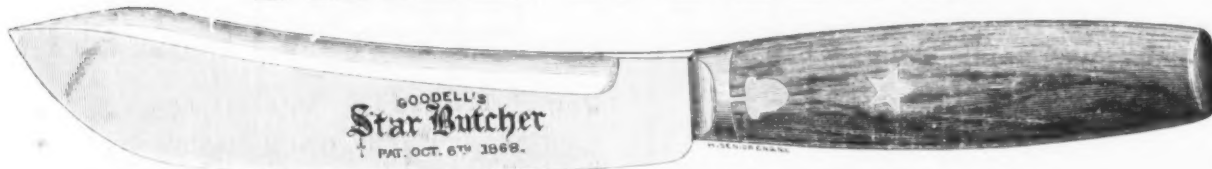
The only all-steel chain pipe wrench in the market. The only reversible
and interchangeable chain pipe wrench. Six sizes.
J. H. WILLIAMS & CO.,
Drop Forgings of Every Description,
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GREENE, TWEED & CO.,
—MANUFACTURERS AND IMPORTERS OF—
Railroad, Mill and Manufacturers' Supplies,
83 Chambers Street - - New York.

WESTERN FILES.

WESTERN FILE CO., Limited,
BEAVER FALLS, PA.

THE BEST FILES IN THE MARKET.

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We don't claim to make all the cutlery manufactured in the United States, but the

BEST TABLE CUTLERY,

Butcher, Hunting, Sticking, Skinning, Steak, Cheese, Butter, Bread and Shoe Knives in the World.

There is no satisfaction in selling goods of an inferior quality, when those of the finest quality, best finish and most approved patterns can be obtained for the same money.

Our illustrated price list will be sent to any retail dealer in cutlery who applies for it; and if we are not able to refer such applicants to some reliable wholesale house in their vicinity, who will furnish our goods at satisfactory prices, we will sell direct, guaranteeing satisfaction.

GOODELL COMPANY, - Antrim, N. H.

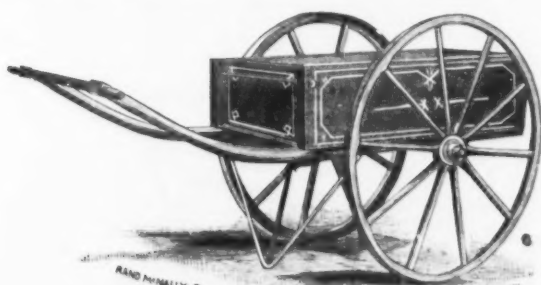
THE ALFORD BERKELE COMPANY, GENERAL AGENTS,

P. O. Box 2002.

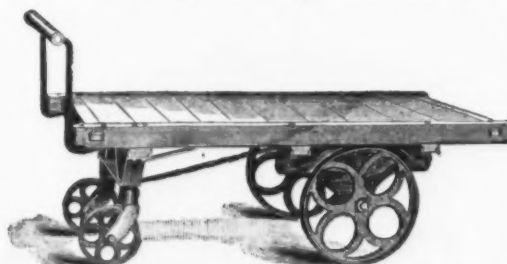
77 Chambers Street New York.

LANSING WHEELBARROW CO.,

LANSING, MICH.

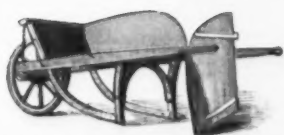


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THE REYNOLDS IMPROVED TRUCK.

Front Wheels Casters. Truck turns in its own length. Runs on or off elevator or scales at any angle. Is easily dumped by lifting handle. Any size. Send for circular.



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St. Louis Stamping Co.,

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BRANCH HOUSES, NEW YORK, CHICAGO.

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AND DRIPPING PANS,

Fine Black Sheet and Galvanized Iron.

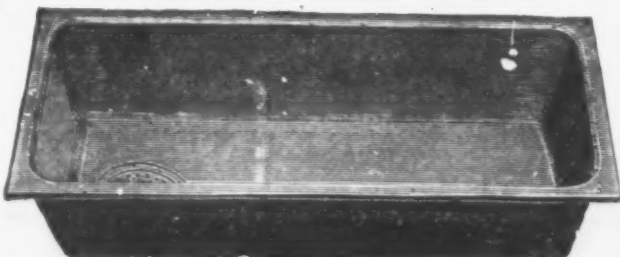
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FOR BUTLER'S PANTRY AND KITCHEN. (Pat. April 12, 1881.)

Entirely new, being stamped from one plate of steel and superior to cast-iron sinks in every particular, being lighter, stronger and more durable.

These sinks, being made of wrought steel, will not break from heat, cold, or any cause whatever.

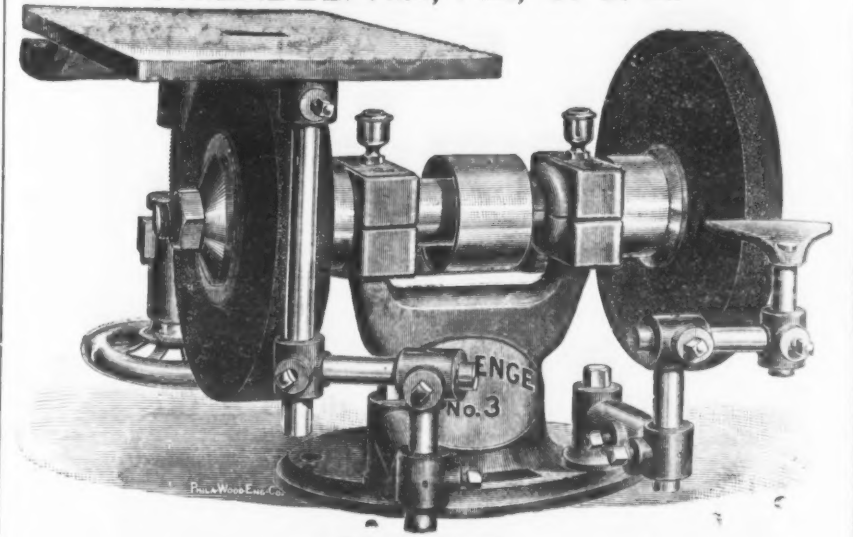
We furnish these sinks painted or galvanized, as desired, at prices—freedom from breakage considered—less than for sinks made from cast iron.



THE KILBOURNE & JACOBS MFG. CO., Sole Manufacturers, COLUMBUS, OHIO.

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and N. Y. City, Agents for New
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C. A. BLESSING, Philadelphia, Pa.
SIDNEY SHEPARD & CO., Buffalo, N. Y.
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GOULD & AUSTIN, Chicago, Ill.
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San Francisco, Cal.
THE SILVER & DEMING MFG. CO.,
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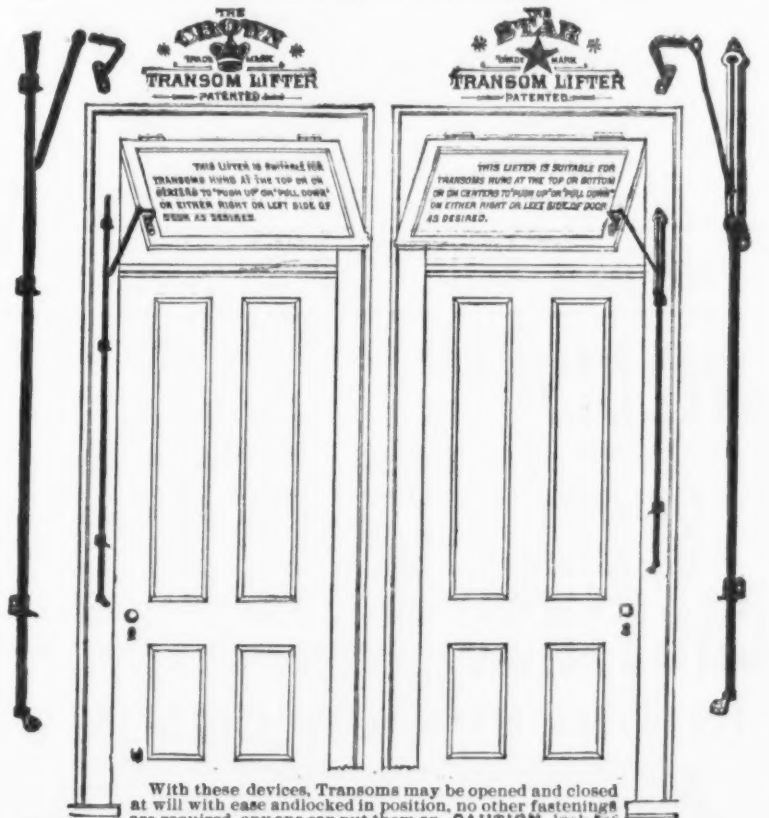
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PHILADELPHIA, PA., U. S. A.



MANUFACTURERS OF

EMERY GRINDERS & POLISHING MACHINES,
Pulleys, Columns and Countershafts.

No. 3 Grinder with surface grinding attachment. Size of Surface Plate 6 x 14 inches, for grinding Die Plates, Flat Irons, Spirit Levels, Lock Fronts, Escutcheon Plates, Gibs and Keys. The machine is indispensable wherever a perfectly true flat surface is required. Price of grinder and surface attachment complete \$35. For sale by leading machinery dealers in the United States. See Catalogue.



With these devices, Transoms may be opened and closed at will with ease and locked in position, no other fastenings are required, any one can put them on. CAUTION, look for the Trade Mark on the handles.

We are now prepared to fill orders for the "Crown" and "Star" Lifters, in such sizes as are listed below, which are suitable for house and office transoms, and hope soon to announce our ability to supply sizes for store transoms.

Price List "Crown" Lifters.				LIST.				Price List "Star" Lifters.			
No.	Length	Size of Rod.	Price Each.	No.	Length	Size of Rod.	Price Each.	No.	Length	Size of Rod.	Price Each.
43	3 feet	3/4 x 1/2	\$0.55	83	3 feet	3/4 x 1/2	\$0.70	83	3 feet	3/4 x 1/2	\$0.70
44	4 "	" "	0.65	84	4 "	" "	0.80	84	4 "	" "	0.80
45	5 "	" "	0.75	85	5 "	" "	0.90	85	5 "	" "	0.90
45 1/2	3 "	" "	1.75	85 1/2	3 "	" "	2.00	85 1/2	3 "	" "	2.00
44 1/2	4 "	" "	2.00	84 1/2	4 "	" "	2.25	84 1/2	4 "	" "	2.25
45 1/2	5 "	" "	2.25	85 1/2	5 "	" "	2.50	85 1/2	5 "	" "	2.50

ORDER BY NUMBER.

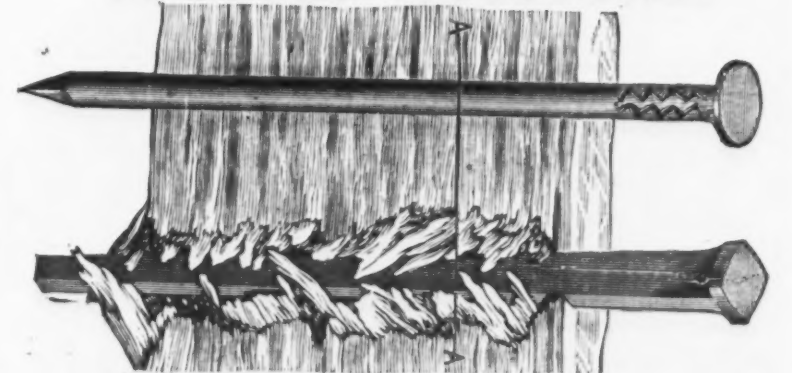
For Sale by J. F. WOLLENSAK, Chicago, Ill.

THE SALEM WIRE NAIL CO.,

SALEM, OHIO,

—MANUFACTURERS OF—

WIRE NAILS.



The above Cut represents the Effect on Wood or a Cut Nail and a pointed Steel Wire Nail.

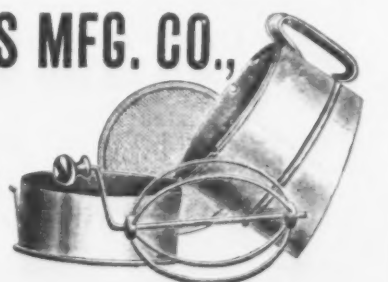
The FRED. J. MEYERS MFG. CO.,

SOLE MANUFACTURERS OF THE

Henry Four-Piece Sifter,

Mixer, Measurer, Weigher, Scoop, Fruit, Starch and Wine Strainer, Rice Washer, Egg Beater, Also, Hunter's and Electric Light Sifters.

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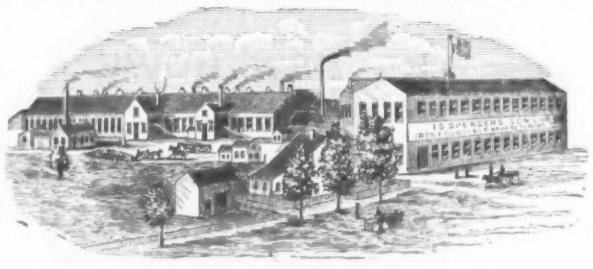
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IRON AND BRASS FOUNDERS AND MANUFACTURERS.

Light and medium weight
GRAY IRON CASTINGS
of Best Material and Work-
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Sound and smooth Brass, Bronze,
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Soft Metal Castings.

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All kinds of light machine work, patented articles, fancy and light hardware, and wood and metal patterns made from samples or drawings. Japanning and Nickel, Bronze, Brass and Copper Plating a specialty. Extra facilities for annealing. Full capacity, 12 tons per day. *Correspondence or Interview Solicited.*

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LARGE HEADS.

CHAMPION Horse Nails

CITY HEADS.



Manufactured from very best SWEDISH METAL. Will not split. Are accurately pointed, tough, strong and hold the shoes. Soft enough to clinch readily; stiff enough to drive without bending. All nails uniform and perfect. They are used in thousands of shops with the best of satisfaction, and are especially liked by "floor-men" for their good, reliable driving.

Made in two patterns, "LARGE HEADS" and "CITY HEADS."

QUALITY GUARANTEED.

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Nos. 4 5 6 7 8 9 10
50c. 25c. 25c. 25c. 21c. 20c.

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LANE'S MEASURING FAUCET.

Price, \$3.00.

or Light or Heavy Molasses, Oils, Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any Measuring Faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw flies. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

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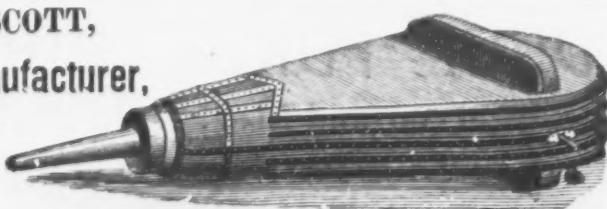
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From 3-4 in. to 10 in. Wrought-Iron Pipe Size.

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Malleable and Cast Iron Fittings and Brass Goods.

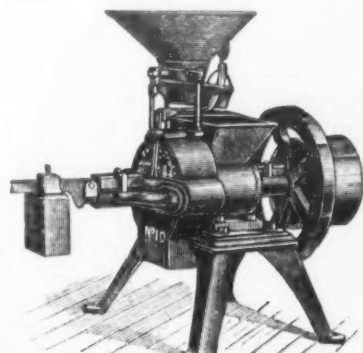
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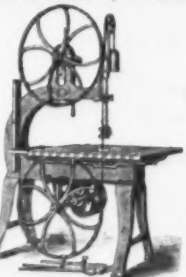
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Other Machines for Pattern Shops.

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The undersigned are prepared to furnish any parties desiring such machinery. Their Self-Feeding Cold Press Nut Machines, which take the iron in the bar or coil, discharge a nut complete with Hole Punched, Face Crowned and Sheds Trimmed. It is strong and simple.

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Straightening & Cutting Wire

Of all Sizes to any Length.

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Tack and Nail Machinery.

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Sold at all Machinists' Supply Stores.

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Manufacturers of a full line of

Solid Cast Steel Hammers, Sledges, Mauls,

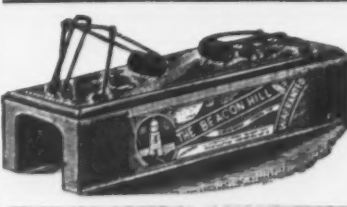
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Every Hammer or Tool having our name is fully warranted. Catalogues and discount sent on application. Export orders will receive prompt and careful attention.



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Always Baited. Sure to Catch.

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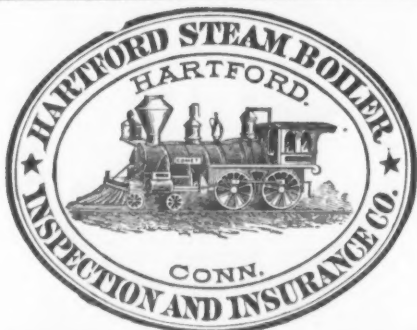
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The LAMONT is the original Combination razor strop and the standard. It positively has no equal. If your razor does not have it, send to us. Best of Russia leather.

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ALSO COVERING LOSS OF LIFE AND INJURY TO PERSONS
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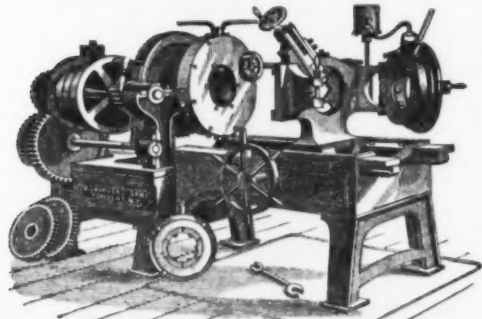
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Pipe Cutting and Threading Machines
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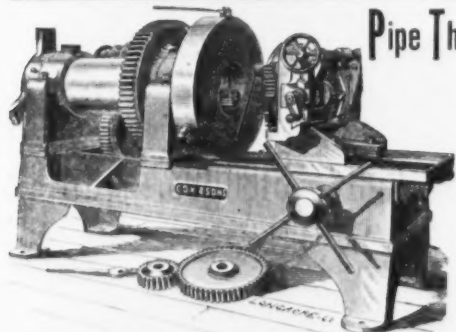
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METALLIC GOODS MADE TO ORDER

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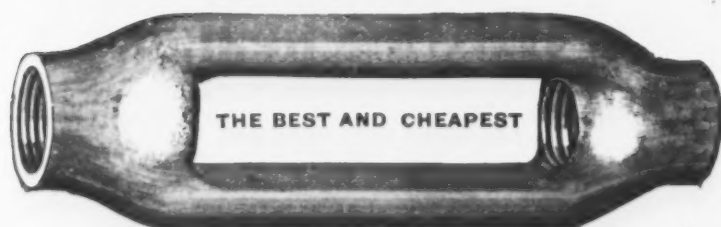
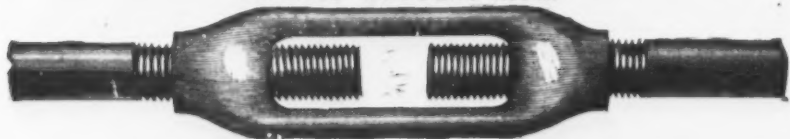
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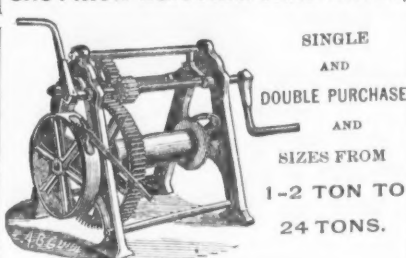
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Merrill Brothers,
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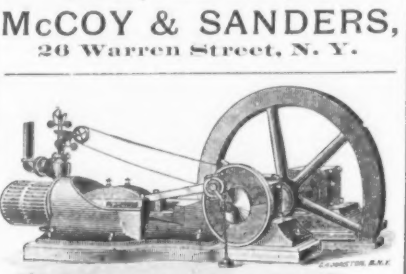
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CAST IRON HOISTING CRAB WINCH,



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FOR BLAST FURNACES.

MOST SATISFACTORY IN USE.

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Anti-Friction Bearings,

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BEST CAST STEEL,

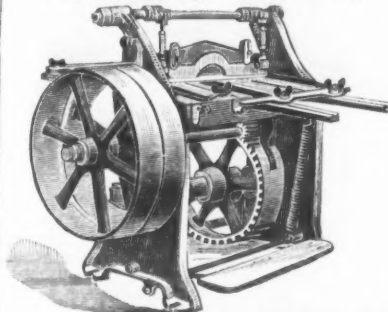
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Presses, Dies and Tools for Working
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CHOPPING SHEARS

FOR Tack and Nail Works

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Manufacturers of

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LIGHT AND MEDIUM WEIGHT

GRAY IRON CASTINGS

OF ALL DESCRIPTIONS TO ORDER.

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WE HAVE VERY GREAT CAPACITY, QUALITY EXCEPTIONAL

We have, in connection with our Foundries, machine shop for all
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Also Japanning and Nickel-Plating Works of our own.

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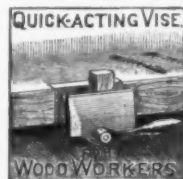
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QUICK-ACTION VISES.



TENSILE STRAIN: 56,000 to 64,000 lbs.
REDUCTION OF AREA—35 to 43 per cent.



Plates 1 1/4 inch thick to No. 14.
30 feet long.
70 inches wide.

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CHARCOAL BLOOMS.

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Bases and Boots for Wire Forms, Piano and Organ Castings, Machinery Castings. Store Patterns taken from the Wood. Correspondence invited for all kinds of Castings. Japanning, Nickel-Plating, Bronzing, & all their Branches. Send for Wire Workers' Catalogue.

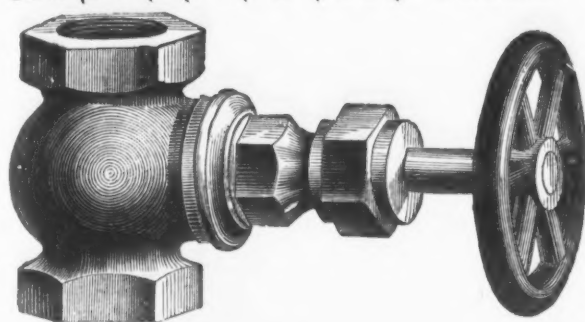
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DROP FORGE COMPANY,

Iron and Steel Drop Forgings,

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For Steam,
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WROUGHT IRON
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Plumbers'
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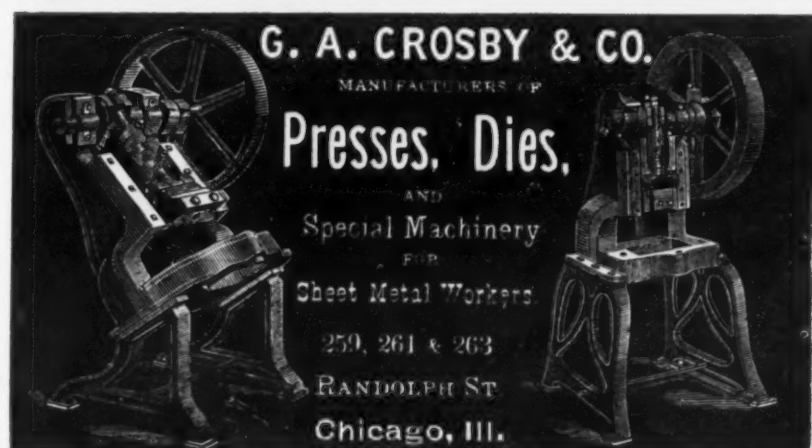
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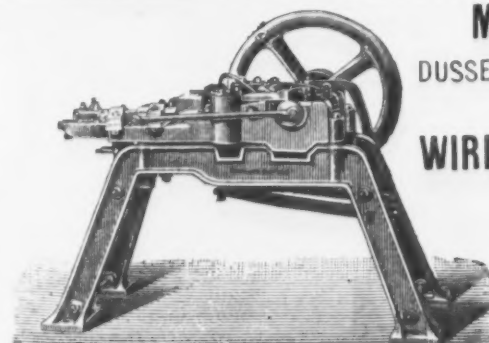
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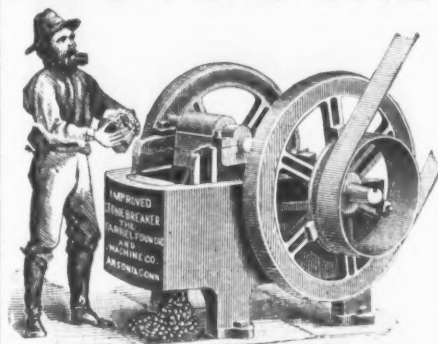
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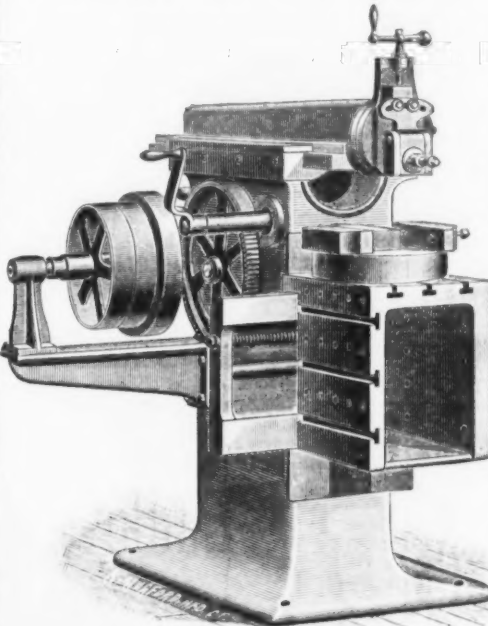
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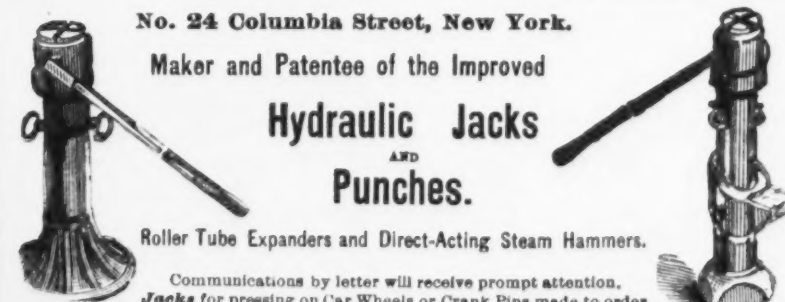
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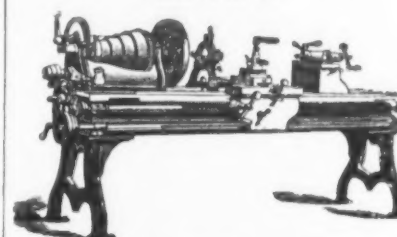
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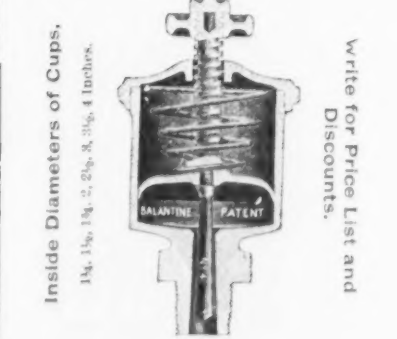
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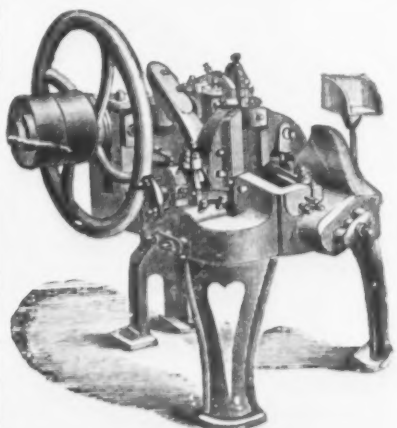


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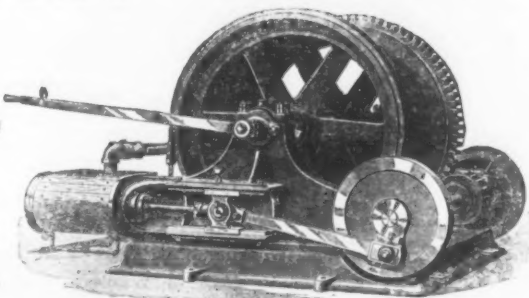
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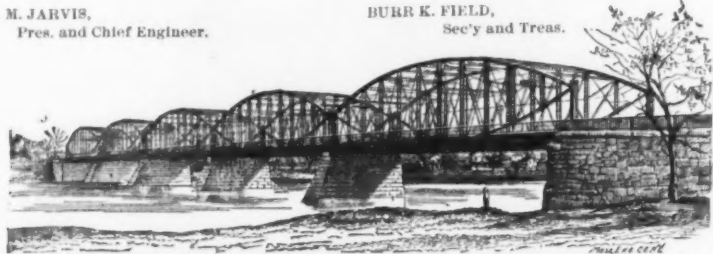
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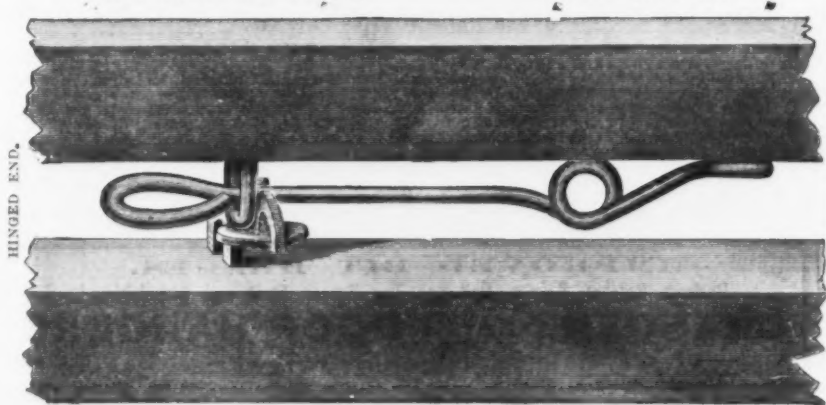
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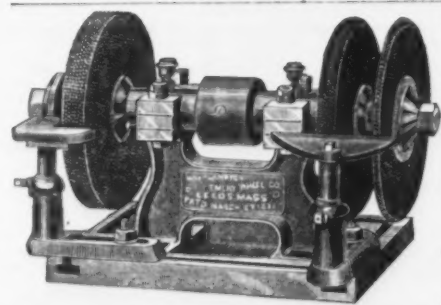
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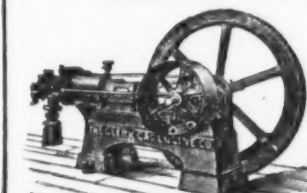
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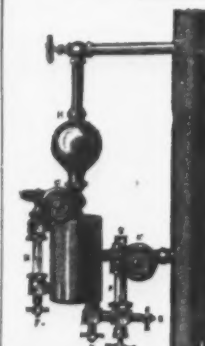
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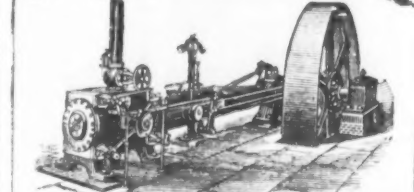
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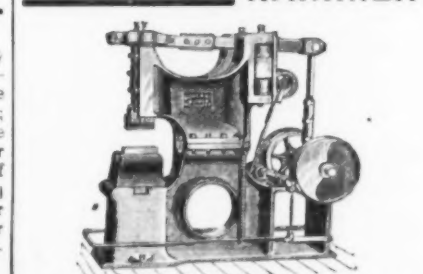
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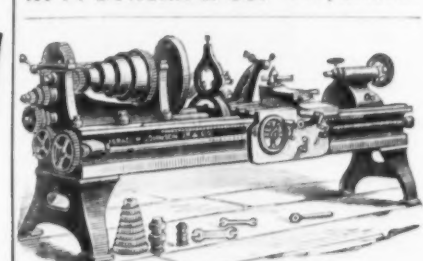
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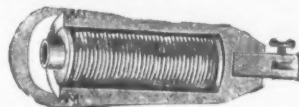
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